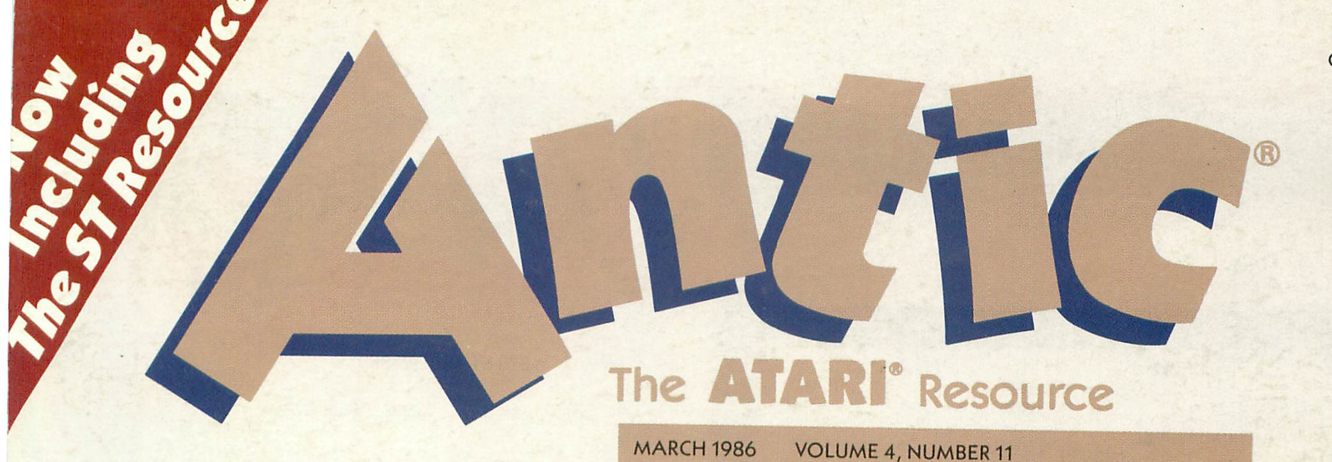
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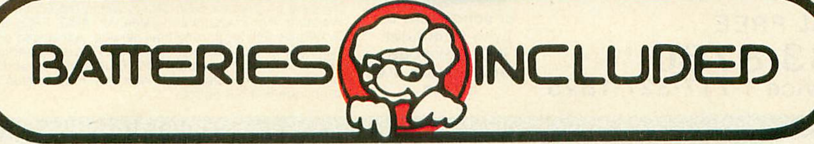
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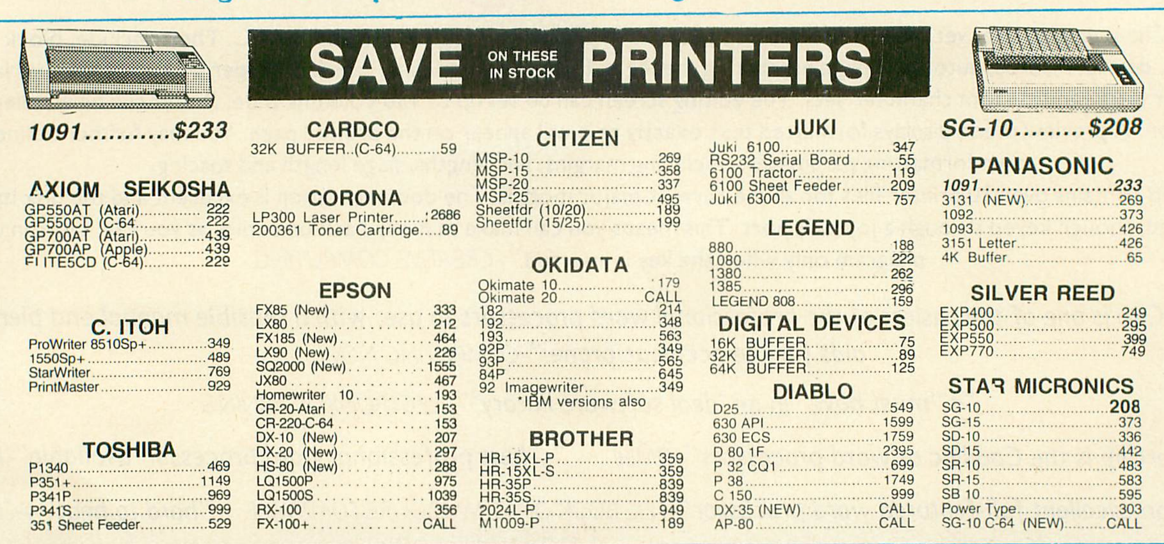
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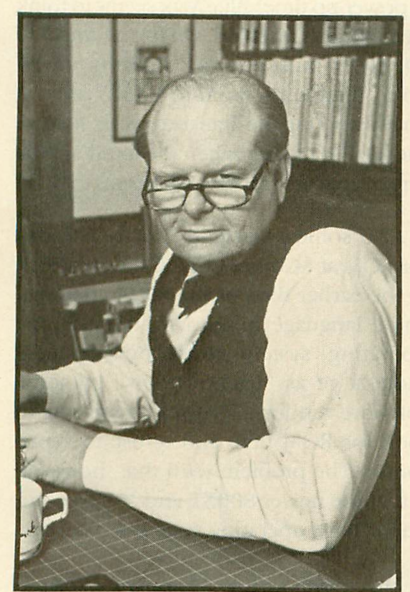
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ABOUT THE COVER

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Model: Dawn Tills from the Frazer-Nicklin Agency.

SUNDAY COMES FIRST

Thank you for the excellent program, *Appointment Calendar* in the January, 1985 **Antic**. I'm a Lutheran pastor and find that the program is a good way to set up dates for our church newsletter calendar. However, a week starting with Monday was not what I needed. It took me a while to change the weeks to start on Sunday, so I thought your readers might want this information. Just change lines 180 and 1590-1660 as shown below:

```
180 DATA SUNDAY,MONDAY,
TUESDAY,WEDNESDAY,THURS
DAY,FRIDAY,SATURDAY
1590 DATA 366247251361,
477351362472
1600 DATA 511462473513,
623614625735
1610 DATA 144725736146,
255136147257
1620 DATA 366247251361,
471462473513
1630 DATA 622573514624,
733614625735
1640 DATA 144725736146,
256247251361
1650 DATA 477351362472,
511462473513
1660 DATA 622573514624
```

Chris Wareham
Spearfish, SD

NO MORE BLUES

Re: Marty Saletta's letter (December, 1985 **Antic**) about Synapse's Blue Max game being incompatible with the 130XE:

Did he boot the Translator disk on his 130XE while pressing the [OPTION] key at power-up time? Blue Max seems to think a cartridge is installed. On the XL and XE, [OPTION] must be pressed during power-up to disable the built-in BASIC, even if you're booting the Translator disk. Release the [OPTION] key when the familiar blue screen appears and the disk begins to boot.

Also, some copyrighted software looks for ROM at $C000-$CFFF. This goes back to the earlier days of the 800, when machine language monitors, added to the operating system ROM board, were thought of as "hackers tools" by some software vendors. Their programs would look for ROM here and refuse to run if found. The problem with that, however, is that the newer 800XL and 130XE computers have operating system ROM here.

I have seen earlier versions of commercial software that refused to boot on a 130XE, giving a prompt to "Remove ROM at $C000." This demonstrates some publishers' initial reluctance to recognize the XL/XE machines as viable Atari computers. Now that they have discovered all that hidden RAM, most new software supports the XL/XE rather than the old 400/800 computers.

Matthew Ratcliff
Ferguson, MO

See Matt Ratcliff's review of the Atari XM301 modem in this issue.—ANTIC ED

HOMEWRITER HELP

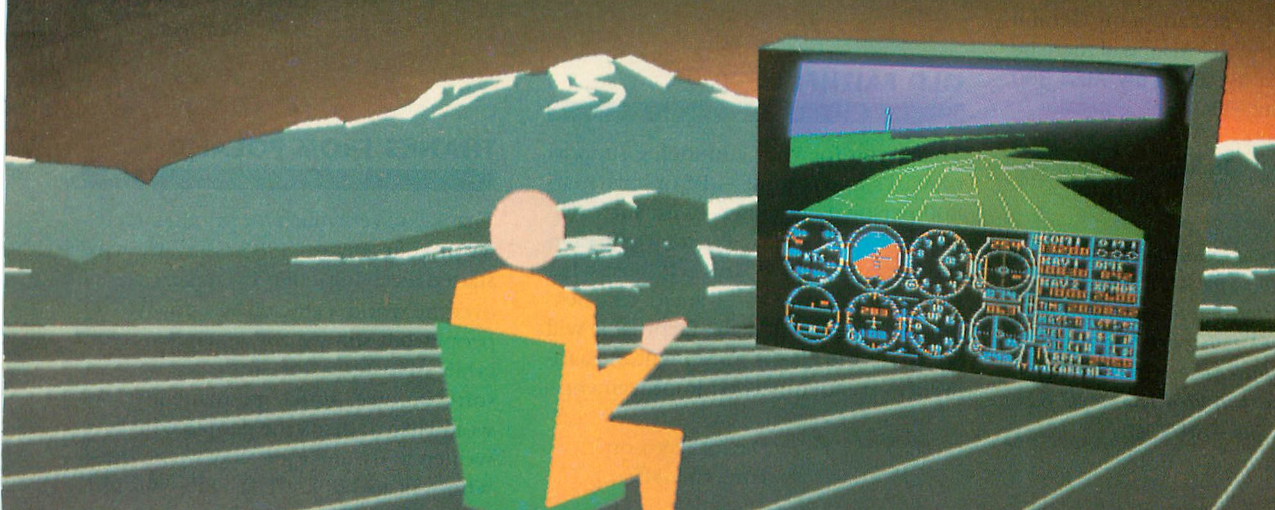
I just bought an Epson Homewriter printer and have been trying to dump KoalaPad pictures. All I get is a bunch of ASCII characters. Help me please! I'm lost and worried that I cannot use graphs and charts on reports that I do.

Sorry, the Epson Homewriter 10 is a rarity—a stripped-down dot-matrix model with NO graphics capabilities. It was designed to print text only, and does that cleanly.—ANTIC ED

continued on page 8

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ST-COMPATIBLE

I am planning to get a 520ST to replace my old Atari 800. Can I adapt my Gemini 10-X printer to the ST? Also, will there be a way for me to use all of my Atari 800 programs on the ST?

Todd Brownstein
Deerfield, IL

The 520ST uses a completely different processor chip than the Atari 800, so none of your old software will run on it. But your Gemini 10-X will work fine, and you won't need to purchase a printer interface. Just buy a standard IBM-style parallel printer cable.—ANTIC ED

MAC LOCKUP

I've discovered that when I use my MAC/65 cartridge and read from memory page D5, my 130XE locks up. When I press [RESET], the computer does a cold start and switches to the built-in BASIC. Then if I read the same locations in BASIC and press [RESET], the 130XE will switch back to the MAC/65. This doesn't happen when I use my Atari Assembler Editor cartridge. I'd like to find out why this happens.

Joe Melville
Menomonie, WI

We spoke with Bill Wilkinson of Optimized Systems Software about this problem. He reports that OSS carts like MAC/65 are "super cartridges" which use bank-selection to determine which section of the cartridge is active. Reading or writing to ANY memory location between $D500 and $D5FF will cause the cartridge to "bank select" a new section of code to execute. If this is done from "outside" the cart, as from BASIC or your own machine language instruction, the cart will switch in "garbage" and then try to execute the garbage, resulting in a lockup.

The answer? There is none, because normally there is no usable RAM or ROM in the memory range between $D500 an $D5FF, and there is no reason to go rummaging around up there. See you in RAM!—ANTIC ED

OLD FAITHFUL 800

Thank you for your continuing support of Atari's "old faithful"—the original Atari 800 personal computer—with such articles as *Fast Moves* by Patrick Dell'Era in the November, 1985 **Antic**. It's just what this novice needed and wanted. One benefit not mentioned is the fact that it will speed up the cursor movement of AtariWriter—a much needed improvement!

David Ferguson
Pontotoc, MS

8-BIT LOVE

Great sadness is in my heart because I no longer own an Atari 800. I owned my 800 for a proud five years and I never regretted my purchase, even though I paid $750 for a 16K computer with Atari BASIC. Friends with Apple IIs and IBM PCs mocked the best personal computer designed before the Macintosh, but I still stuck by my Atari. Until now.

The lack of 80 columns never bothered me until I began to do long essays with footnotes and bibliographies in college. Little else was wrong with my Atari, but I still had an uncontrollable urge to buy another computer, either an Atari ST or an IBM PC compatible. The 8-bit computer I used and loved is now in the hands of someone else, and I will soon be in the 16 or 32-bit world.

I have some advice for anyone who wants to sell their 8-bit Atari—DON'T DO IT. That is, unless you are absolutely, positively, unequivocably sure that you can handle the shock of leaving the unmatched Atari full-screen editor, the brilliant Atari CIO system, and the best video games behind you just to get MS-DOS or TOS.

Good luck, former fellow 8-bit Atari users. Be proud, and live long and happy lives.

Victor Kan
Columbia University
New York, NY

THANKS FROM POLAND

Thank you very much for printing our letter in your August, 1985 issue. We have started receiving letters from Atari fans all over the world. Our club has grown to 60 people, but still we are dependent upon other Atari users for software. Without software, we suffer permanently. We would like to thank the people who have written to us, and especially thank those who sent us books, magazines and programs. We will answer all letters, but of course it will take some time. With best wishes and regards from Krakow:

Wieslaw Migut
Atari User
Club Poland
P.O. Box 375
30-950 Krakow 61

BUGGY BASIC

When I found that fatal lock-ups occurred when I wrote BASIC programs on my 800XL, I sent my computer to Atari. They sent back the computer with new chips, but the bug was not eliminated. After this, I called Atari Germany for over half a year. But they couldn't tell me why the bug occurs. After this time, I have given up. But I read in a German magazine that there is a bug in the BASIC ROM. Can you help me?

Hans-Joachim Riedl
West Germany

You'll find a type-in fix for buggy BASIC Revision B, Matthew Ratcliff's Revision C Converter, *in the September, 1985 issue of* ***Antic***.—ANTIC ED

i/o board

PERFECT DOS

While re-reading your May 1985 review of the PaperClip word processor, I noticed that **Antic** said it's possible to transfer LJK Letter Perfect Files into standard Atari DOS files. How is this done, and where may I buy this program?

David Salowitz
PPN #76556,2606
(ANTIC ONLINE query)

LJK Enterprises, 8753 Big Bend Boulevard, St. Louis, MO 63119 has a $29.95 disk utility that will do this for you.—
ANTIC ED



VIEW.BAS LOADING

If you're having trouble using the VIEW.BAS program (December, 1985), you should make sure you've typed in the D: device identifier along with the name of the picture you wish to view. For example, to load the EVE.PIC picture included on that month's disk, you'd type in D:EVE.PIC.



Antic welcomes program submissions from readers. Just send us your program and accompanying article, we'll pay you if we publish them.

We prefer to see your listing and text on both *paper and disk.*

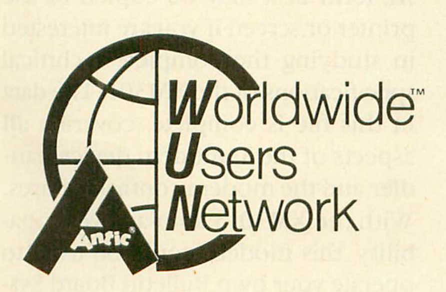
Sending us your program on cassette is also okay. But please put program copies on *both* sides of the cassette.

Always include a stamped, self-addressed envelope so your materials can be returned.

antic online

ANTIC ONLINE MODEM SURVEY

Rate your own modem!



What modems are most widely used by Atari owners in 1986? What modems do Atari owners like best? Help ANTIC ONLINE answer these questions, so we can share the information with the entire Atari community.

Type GO ANTIC when you log onto CompuServe in February. You'll find the latest ANTIC ONLINE Users Survey. Last November, over 1,000 subscribers voted for their favorite printer. This month, vote for your favorite modem and you'll read the survey results in the June, 1986 issue of **Antic** Magazine.

SIGNING UP

If you're not a CompuServe Subscriber yet, see your local computer dealer or phone (800) 848-8199 for information about signing up. Ohio residents phone (614) 457-0802. There is no extra charge for accessing ANTIC ONLINE or SIG*Atari.



Coming Next Month

April '86

COMPUTER MATHEMATICS

- Atari BASIC Fractals
- Decision Tree
- How LIFE Works

PLUS

- **Daisywheel Screen Dump**
- **ST BASIC VDI Caller**
- **Vegetable Garden Planner**
- **AtariWriter Plus Review**

ATARI XM301 MODEM

Telecomputing power without the price

by MATTHEW RATCLIFF

Priced at only $49.95, the new Atari **XM301** modem is a complete, powerful tool for telephone communication with other computers. The included XE-Term software uses the near-universal XMODEM file transfer standard—making it easy to download or upload public domain programs over the phone.

The first thing you notice about the 300 baud XM301 is how tiny it is—not much bigger than a deck of playing cards. And it does not require a separate power supply. Yet the XM301 delivers auto-dial (tone or pulse) and auto-answer (so it could be programmed to operate a bulletin board).

The XM301 is direct-connect, so you don't need any special interface equipment to hook it up to your Atari system. Note that the XM301 must be the last device in the serial bus chain (plugged into your disk drive), because it has only one Input/Output (I/O) connector. And if you have a 1200XL computer, the XM301 will not work with this model. The manual instructs you to contact Atari Customer Service to get your 1200XL modified (apparently minor) for XM301 compatibility.

The XM301 has one modular phone jack. Most direct connect modems have two, in order to allow an extension phone hookup for listening to your dialing progress. However, this is no problem since the XM301 lets you hear everything through your video speaker when you call another computer. Once the connection is actually made, the sound shuts off and the XM301's single LED indicator lights up.

The XM301 comes with a 49-page manual that is a concise, accurate guide to connecting the modem and using the XE-Term software. And the package also includes some $270 in discount offers for CompuServe, the Source, Knowledge Index (Dialog) and Official Airline Guide.

XE-TERM RAMDISK

When the XE-Term disk is booted on the 128K-memory Atari 130XE computer, it creates RAMdisk D8: automatically. This RAMdisk can be used for faster downloads and uploads. The XE-Term disk also loads correctly on other Atari computers with a minimum of 32K memory.

The HANDLER.DOC file on the XE-Term disk may be copied to the printer or screen if you are interested in studying the complete technical specifications of the XM301. The data in this file is complete, covering all aspects of the T: modem device handler and the modem control features. With the XM301's auto-answer capability, this modem could be used to operate your own Bulletin Board System (BBS), with the right software.

The T: handler seems to be identical to that of the widely used Atari 1030 modem. I tested the XM301 with a 1030 modified version of AMODEM and it worked well. Other BBS operators have reported no trouble using **Antic's** powerful 1030 program *Pro*Term* (August, 1985).

MENU OPERATIONS

XE-Term is operated via onscreen menu boxes. Pressing [D] gives you the auto-[D]ialing menu—where you can [E]dit or [D]ial any of the five stored phone-numbers. [K]eyboard dialing can be used for numbers that are called less often. You may [C]hange from the default pulse mode to the faster tone dialing mode, if your phone service supports it.

XE-Term auto-dialing also includes a single [L]og-on macro that will automatically enter the entire sequence of numbers, commands and passwords needed to connect you with the online service you call most often.

The [S]et auto-answer mode is ideal for making Atari-to-Atari connections in order to trade programs over the phone. You could set the answer mode and have a friend call at a specified time to automatically make the connection. You must both be in the "half-duplex" mode for this type of hookup.

OPTIONS

Once you are online, pressing the [SELECT] key will get you back to the Functions Menu. A subsequent [RETURN] will put you back online if the connection is still open. Two commands are not shown in this menu. While at the Functions Menu and still online, pressing [CONTROL] [H] will hang up the phone. Pressing [O] will send you to the Options Menu where some of the more advanced technical commands are available.

Pressing [T] in the Options Menu will toggle between ATASCII (Atari ASCII) and standard ASCII modes. Each time it is toggled, you are prompted to save the changes to disk. You will use ATASCII for Atari bulletin boards, and ASCII for non-Atari boards and commercial information services. You may find it convenient to set up two XE-Term disks—one for ASCII and another for the ATASCII.

From the Options Menu you may also adjust [I]nput and [O]output parity (almost always "none"). The [L]eft screen margin may be set to zero or 2. The [D]uplex command toggles between full and half duplex modes. Use half duplex for Atari-to-Atari (or any other computer) communications where both computers are running a terminal program. Changes may be saved to disk if desired.

Back at the Functions Menu, you may [S]end or [R]eceive a file using XMODEM protocol. This function also works with ComupServe's "A" file transfer protocol to download files with .BIN extenders. You are prompted for [T]ext or [B]inary file transfer. Use binary for any file you wish to send/receive "as is." Text transfers may "translate" Atari's carriage return codes into the standard ASCII code.

You may [C]apture information, such as HELP menus, to printer or disk. Pressing [START] begins the capture and pressing [START] a second time closes capture and the file. You cannot selectively capture information with the [OPTION] key toggle, as is done in all other Atari terminal programs. [U]pload may be used to send text files, such as preformatted messages, to some systems.

Pressing a numbered key 1-8 displays a directory for that drive. Pressing [F] brings up the File Utilities Menu. From here you can [L]ock and [U]nlock files. Files may also be [R]enamed or [D]eleted.You may [Q]uit from the Functions Menu to DOS. This is an especially nice feature for the 130XE. Files downloaded to RAMdisk may then be transferred to floppy disk.

LOGGING OFF

XE-Term software is superb! I like it better than any commercial telecommunications program I have used to date. The XM301 modem performs well and has all the features you need. The manual is complete and accurate. Together, the XM301 with XE-Term packs more telecomputing power for the price than any other Atari modem hardware/software on the market.

XM301
Atari Corp.
1196 Borregas Avenue
Sunnyvale, CA 94086
(408) 745-2000
$49.95, 32K disk

*Matthew Ratcliff is a longtime **Antic** programmer with a special interest in online communications. His Atari 'Toons appeared in the August, 1985 issue.*

MEGAMAX C for the Atari ST™

Megamax C is a complete development system for the Atari ST™. This package includes all that is necessary to develop executable programs within the GEM environment.

Compiler Features Include:

- **One Pass Compilation**
  Run it once to compile your text down to an object file ready for linking; no more multi-pass compiling.
- **In-Line Assembly**
  The Megamax C compiler also acts an an assembler. You are able to intermix 68000 assembly code with C code to achieve optimal speed when desired. Variables defined under C may be directly referenced from assembly code.
- **Register Variable Support**
  Six register variables are available. Use of register variables, while optional, significantly increase speed and reduce code size when using pointers and integers.
- **Optional Code Improver**
  If desired, the code may be improved by running an optional post process. This process performs peephole optimizations on the code making it faster and more compact.
- **Full GEM documentation**
  All GEM routines are documented. Including AES, VDI, bios.
- **Mouse-based program editor**
  Multi-window and "C" specific.

A Resource Construction Program is Included

The Resource Construction program allows the creation of menus, dialog boxes, icons, and other GEM objects.

The System Library Includes:

A full complement of Unix™ style routines and support of all GEM routines.

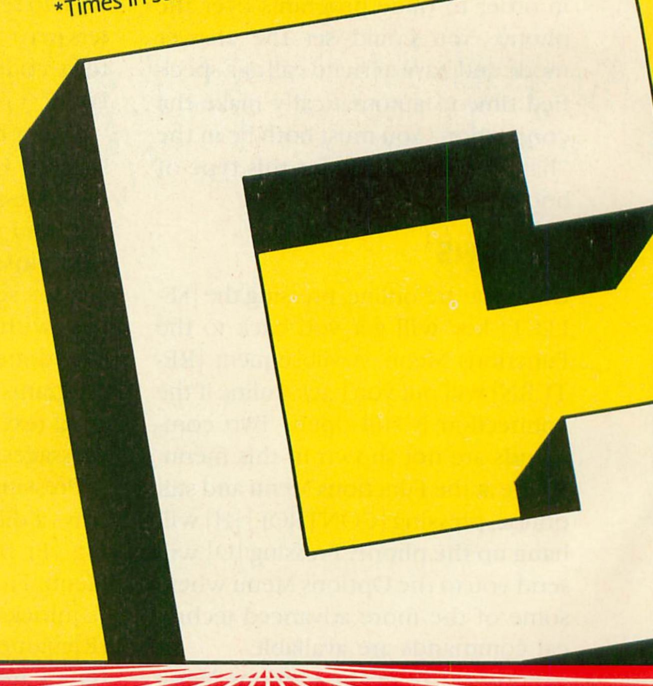
The Software Package Includes:

- Full-Scale Implementation (K&R) C Compiler
- Code Improver • Linker • Librarian • Standard C Library • GEM Routines Library • Disassembler
- Editor • Make • Resource Construction Program
- Full Documentation (C System and GEM)

All only $199.95

Benchmark	Compile Time	Execution Time	Size
Sieve	70	2.78	5095
"Hello, world"	63	N/A	4691

*Times in seconds, Sieve with register variables.



Megamax, Inc • Box 851521 • Richardson, TX 75085 • (214) 987-4931

PRACTICAL APPLICATIONS

SUPERSCRIPT

Reviewed by CHARLES CHERRY

Progressive Peripherals & Software
464 Kalamath Street
Denver, CO 80204
(303) 825-4144

64K disk, requires XL or XE

$79.95

Superscript is a very powerful and full-featured word processor that joins PaperClip, Letter Perfect, AtariWriter Plus and very few others as the premier writing tools for the Atari. Originally developed in England by Precision Software, it is perhaps the first world-class Atari 8-bit application software to actually arrive from overseas.

Superscript has all the normal word processing capabilities you'd expect—but it seems to do many of them a little bit better. For instance, the centering command can be left on and it will center the text for line after line without further attention. You can save a text block to disk as a new file, or even change the block's letters back and forth between capitals or lower case.

COMMANDS PLUS MENUS

The user interface is more important in a word processor than in any other productivity software. The creative nature of writing requires a transparent and intuitive program. Experienced "power users" like the speed of a command processor. They don't mind learning a lot of sometimes obscure commands in order to enjoy the speed of single-key entry.

In contrast, occasional users hate to look up all those obscure commands. They'd rather plow through seemingly endless menus of on-screen choices. Superscript lets you have it either way. It has menus and submenus and sub-sub-menus. But you don't have to use any of them, because the program also supports single-key [CONTROL] commands for most of the common functions.

Speed is another important part of the word processor interface. It's frustrating to suspend your writing while the computer takes care of housekeeping. Superscript is very fast in most functions. You can move around the text instantaneously. I was never able to type faster than the program's ability to accept text, not even in the insert mode.

The only place where things slowed was when I used the [INSERT] and [DELETE] keys. Incidentally,

continued on next page

these two keys do not work the same way as they would in a normal Atari screen editor. Along with a strange way of setting and clearing indentation tabs, this may be a residual from the program's original incarnation on the Commodore 64. But overall, Superscript is very easy to use on the Atari.

MACROS

Superscript is one of the few Atari word processors that gives you "macros." A macro is a string of characters which can be assigned to one key. When that key is pressed, the whole string is typed out. This capability allows you to "record" frequently used phrases such as your signature, or difficult-to-type words and numbers, so that one stroke types them quickly and accurately each time.

Just as useful is the ability to redefine the entire user interface. If you don't like the commands that Superscript uses, then change them to something that makes more sense to you. If you do complicated things that require extensive command strings (not unusual in a program as powerful as Superscript), the whole process can be automated to run with a single stroke. As far as I know, Superscript is the only Atari word processor capable of doing this

MAILMERGE

Superscript's mail-merge functions are very flexible, yet easy to use. You can place any field (even of variable length) anywhere in the document. It merges from a simple text file rather than a database, which makes creating mailing lists easy. But any fancy sorting and selecting is impossible. You can use elementary "equal or not equal" screening to get only the addresses in New York or to skip everyone named Jones. If you need more power, you can use Superscript to reformat the ASCII output from a database or spreadsheet.

MATHEMATICS

If you use your Atari for billing, or for writing financial statements, you will be especially pleased with Superscript's extensive mathematical capabilities. You can add, subtract, multiply, divide, or do percentages on the built-in calculator. You can enter numbers from the keyboard, or bypass retyping by using the cursor to copy numbers directly from the text.

But what really seems to be unique to Superscript is that you can calculate in columns, rows or tables within the text. In fact, this arithmetic can be automated with macros to create a mini-spreadsheet.

Text width can be expanded up to 240 columns. This is very useful for mathematical tables and charts. The screen acts as a window which scrolls over the larger text area. There is also a "screen print" mode which uses the same display technique to show what the printed page will look like. The normal screen display is 21 lines by 40 columns.

DICTIONARY

Superscript comes with a 30,000-word dictionary—in both English and American. It is very easy to use and relatively fast. You get the usual word counts and options although it does not suggest alternate spellings. However, adding new words is extraordinarily easy. You just press one key and the new word is included in the main dictionary. There is no separate user dictionary requiring additional searches.

PRINTING

Superscript comes with drivers for most popular printers. It also has a customizing section which allows you to create drivers for other printers. My Gemini 10-X did not respond to Superscript's Epson driver, but I was able to get it running by using the Diablo driver and modifying the control characters.

Print formats are very flexible. You can print every other text page, if you need book style back-to-back pages. You can also print alternating wide margins to allow for binding. You can "print" a copy to the disk. You can chain files to make longer documents. Superscript even supports RS-232 serial printers, another unique capability among Atari word processors as far as I know.

LIMITATIONS

Superscript runs under DOS 2.5 and requires either a 130XE or an Atari XL with at least 64K. It will not operate on the older Atari 400 or 800 models. It worked on an Atari 1050 disk drive, but would not boot up on an 810 model. It also worked on the Indus, which was the only third-party disk drive I was able to test. However, Superscript text files can be moved to all Atari computer models.

On the 130XE, Superscript provides a second text area. So two files can be in memory at once and text can be moved between them. There is not a split screen, but you can flip back and forth between the files.

Text capacity is roughly 30,000 characters, about standard for Atari word processors. But memory is allocated by line, so you can run out of memory after 780 carriage returns. Fortunately the disk storage uses a more rational scheme.

When engaged in heavy editing, the program occasionally dropped a couple of characters, and once it duplicated a line. Another time I got an "out of memory" error with less than 200 lines of text. But the glitch sorted itself out after I moved from the beginning to the end of the file a couple of times and reformatted the text. None of this was catastrophic, but I hope future revisions will make the software more predictable.

The Atari owner finally has a variety of high-quality writing tools to choose from. Superscript's several unique capabilities make this first-rate word processor worth strong consideration, especially if you own an XL or XE and include substantial arithmetic in your text files.



ELITE PERSONAL ACCOUNTANT

Reviewed by STEPHEN ROQUEMORE

Elite Software
14897 Interurban Avenue S., #60
Seattle, WA 98168
(206) 246-5122
Requires Atari BASIC or BASIC XL
$48.95, 48K disk

Until now, there have been few good personal finance programs available for the Atari. **Elite Personal Accountant** is a bright new entry into the ranks. Don't be fooled by the amateurish packaging. This new program from a small company has just about every capability built into it that anyone could dream up. And the manual is one of the finest I have ever encountered.

Elite Personal Accountant will handle 79 categories divided into income, expense, asset, and liability groups. As many as nine credit cards are handled separately, but counted as liabilities. There are 17 different transaction codes available. The reporting capabilities go well beyond the competition, with an option that allows you (within limits) to design your own reports. Above all, the program disk is *not* copy-protected, allowing you to make your own backups.

The program contains extensive HELP facilities easily accessed without disturbing your work in progress.When you are in ADD or EDIT Mode, there is even a Calculator function to aid your data entry. In the Utilities Menu you'll find the usual disk management functions like formatting disks, directory commands, and other DOS choices. There is also an option to view the contents of any file on the disk. You can even disable the I/O sounds usually heard during drive operations. The program will handle up to three drives for your data disks and you may switch between them at any time.

Elite Personal Accountant is easy to understand and to learn. The outstanding manual provides a wealth of personal-finance knowledge, along with interesting comments about the author and the program's development. Documentation is indexed and logically organized so that the topics flow along in a way that allows use as a tutorial. After giving you extensive background information, you are led into the Menu structure. By the time you have finished the manual you will have a thorough understanding of the program as well as a good overview of general accounting.

There is an evaluation sheet in the manual for you to mail back, so the author can improve the program, or correct problems or even implement suggestions. The author even provides his telephone number, address and an invitation to contact him personally if you need help!

The program was developed on an 800XL computer using Revision B BASIC. If it is run using Revision A, occasional errors may be encountered if you accidentally enter alpha characters in a numeric field. Following the instructions in the manual should get you past these errors.

I highly recommend this software to anyone looking for their first personal accounting program or to anyone dissatisfied with their current software. I'm switching to Elite Personal Accountant from now on.

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HOME CONTROL SYSTEM

Reviewed by BILL MARQUARDT

Computer Engineering Applications
P.O. Box 4878
Las Vegas, NV 89127
(702) 646-5138
$89.95, 48K disk

It's a scene straight out of a Saturday morning cartoon like "The Jetsons." The alarm clock rings and coffee instantly starts perking. You lie in bed all day and eat bonbons as your fingertips on the Atari computer at your nightstand control the stereo, the thermostat, the lights, the microwave oven . . .

With a little work, your fantasies *might* be answered by the **CEA Home Control System**—a hardware/software package that lets your Atari computer run the household electronics. You can control a heater or air conditioner and up to three 110-volt AC appliances—stereos, television sets, toasters, lamps. Uses are limited only to your imagination. One word of warning, however—Home Control will require the complete dedication of your Atari and disk drive.

For the cost-conscious, Home Control could be used as an energy-saving device by turning the heater or air conditioner on and off. The disabled or bedridden person might find it invaluable. Perhaps the best use would be to turn lights and other appliances on and off when you're on vacation to foil would-be burglars.

The software is essentially a database manager. You enter the times and days that you want the appliances attached to the control unit to be turned on or off. As the program continues to run, it searches the database and acts upon events, such as temperature changes, that coincide with the real-time clock.

In addition to software, Home Control includes a main power supply module, a temperature probe, a heater/air conditioner control module, a power control module, and the necessary connecting cables.

The main unit plugs into joystick port one and a 110-volt AC outlet. There are five RCA-type jacks on the rear of this module. The temperature probe plugs into one of these jacks, the heater/air conditioner module goes into another, and the remaining three jacks are for power control modules. Each jack is separately programmable.

The power control module is simply a little black box that plugs into an AC outlet and serves as a programmable switch for another device that plugs into the box. The heater/air conditioner port is controlled by the ambient room temperature, and the program supplies a "duty-cycle" option so that energy can be conserved in cooling or heating your home. This module requires you to connect a small black box to the wires inside the thermostat of your home.

Documentation consists of seven typewritten pages, and leaves something to be desired. For instance, it does not make clear just how the heater/air conditioner port is to be programmed. But a little experimentation with the program filled in the gaps, and I had no real problems with it.

I found this product worked as ad-

continued on next page

vertised, but there were two minor problems with the software. Error trapping is not good. For example, you will crash the program if you accidentally press [RETURN] when a prompt expects data.

I found another slightly more serious error. When you program a temperature into the database, both digits remain on the screen. If the next entry is a single digit command, it appears as a two digit number, retaining the second digit of the temperature on the screen. This was slightly confusing until I figured out what was happening.

The future as envisioned in countless World's Fairs and sci-fi fantasies is not quite here yet. Do you really need a 48K programmable alarm clock to turn on your radio and coffee pot in the morning? If so, Home Control may be what you've been waiting for. At any rate, I give it a good mark as far as the hardware goes, but only a satisfactory one for the program and documentation.



SYNCALC TEMPLATES

Reviewed by STEPHEN ROQUEMORE

Broderbund/Synapse Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
48K Disk, SynCalc required
$19.95

SynCalc Templates is a collection of 22 different "prebuilt" spreadsheets for use with **SynCalc** software. These spreadsheets cover the most commonly-used formats for financial planning, so you won't have to spend hours building and debugging your own.

There's something for everyone on this disk. Many of the spreadsheets are for the business or financially-oriented user. Several of them are quite useful to the average in-home user.

There are stock and bond portfolio evaluations, expense account reports, three different economic order quantity spreadsheets using a variety of criteria, a linear regression template, two different queue models, and a rate of return calculation. Still other spreadsheets provide rent vs. buy comparisons, mortgage evaluation, property inventory, financial ratio analysis and a net worth statement.

For the executive who cooks at home or abroad, there are also spreadsheets which convert common kitchen measures into various equivalents and metric measurement conversions. The set even includes two different check register applications and a personal appointment calendar.

All templates are accompanied by a set of insert pages that fit right into the SynCalc manual. This documentation explains how to use each spreadsheet, and is well written in the style of the original manual. The template disk itself is write-protected, so that the originals can't be accidentally destroyed. You need to copy each template to another disk before you start using it.

Some of the spreadsheets are extra-wide and must be printed in sections, or in a condensed print font. Some of the more complex financial spreadsheets have been set up with auto-calc turned off. It is adequately noted where this is done.

SynCalc Templates allow the spreadsheet user to get up and running in a minimum of time. I highly recommend this product to anyone who needs to do financial analysis or other business-oriented number crunching.



YOUR PERSONAL NET WORTH

Reviewed by K. W. HARMS

Scarborough Systems, Inc.
25 North Broadway
Tarrytown, New York, 10591
(914) 332-4595
48K disk
$79.95

Your Personal Net Worth (YPNW) is simple to use, yet it's a fully capable home accounting package. It follows "double entry" accounting practices, but it automatically creates most of the second entries.

The manual is clear, concise and generally free from jargon, although it sometimes confuses facts between the three different brands of computers it covers.

A nice on-screen help system provides a tutorial system of some 30 screens which is sometimes better than the manual. To use the system, however, you'll have to switch disks because YPNW accommodates only one drive.

Enter an acceptable account number and the name immediately appears (bad account numbers are trapped). I found the screens well designed and uncluttered. Enter one check number and YPNW automatically supplies the next number. Enter one date and it remembers the date for the next entry (you can change either). Every action which would create or destroy data is preceded by a confirming question.

The manual provides excellent instructions on backing up your data files—which you should do frequently, of course. The program disk is protected and you're supposed to send in the bad disk along with $5 if you need a replacement—which will of course leave you without use of the program for a few weeks.

Already set up on the data disk are 10 income accounts, 24 expense accounts, 21 asset accounts and 10 liability accounts. Multiple checking accounts (10), credit cards (no limit!) and loans are allowed and automatically tracked.

YPNW keeps one monthly budget amount for each account. I found that this is more budgeting than I do.

A straightforward income statement lists year-to-date balances through the period you specify. A month-by-month comparison report is not available. The net worth statement lists assets, then liabilities in a single column, not side by side. Net worth is buried above "total liabilities." A handy transaction history provides a way to review old records.

None of the reports seem to provide perforation skipping, top of page or other niceties. No graphics are provided either. My Atari and Epson printers work fine with the program and I believe that most others also will.

YPNW automatically creates tax records as you enter income and expense items. This helpful touch is somewhat marred by listing the entries by date rather than as income or expense.

Bank record keeping is well thought out. Each time you enter a payment, income or similar item, YPNW automatically creates a bank record and gets ready to help you reconcile your bank accounts.

Although YPNW will print checks

continued on next page

(an order form for special checks is provided), I found the process cumbersome. You print each check as the transaction is entered, not in a batch. Names and addresses must be typed each time.

An oversimplified stock portfolio system is included as an independent application.

Overall, YPNW does what it claims. It is well implemented and generally adequate for straightforward home accounting. Do you need it? Well, that depends. A printer is a necessity. You'll need two to three evenings a month to feed entries into the system, post and report. Add another evening to reconcile the bank account. And plan on three or four evenings to set up your data disks and learn the system in the first place.

My guess is that if you now do these things by hand you'll find YPNW a handy tool, easy and satisfying to use. But those who don't regularly do home accounting by hand probably won't be converted.



TEACHER'S PET

Reviewed by STEPHEN ROQUEMORE

Someplace Special Software
11 Woodland Drive
Troy, PA 16947
(717) 297-2336
48K disk, Atari BASIC
$50

Teacher's Pet is an integrated vertical application system for educators. It takes care of essential classroom record-keeping chores such as tracking student rosters and grades.

The package consists of 10 different programs on two disks, contained in a 3-ring binder that also holds a backup copy of each program disk plus four pre-formatted data disks—all color coded. The manual is well-written, with an addendum sheet for Version 2 and a quick-reference cardboard sheet.

Unfortunately, the manual neglects to explain that BASIC must be installed when you turn on the system. Nor does it explain how to start using the program from scratch. I had to discover by experimentation that it was necessary to begin with the NAMES program—which sets up the class rosters and the grading scale. You are limited to 50 names of 20 characters each.

CHANGES provides for maintenance to the class rosters. SCORES allows the entry of test marks and attendance data. Pressing the [OPTION] key in SCORES will display additional data for each student on the screen You may save time by entering scores in the CLASS option, which scrolls you through the roster.

The CURVE program allows graphing (but *not* printing the graphs) of students' test averages and grading scales, including what-if experimentation. FINAL AVERAGE supports complete marking period averages and printouts. The INSPECT program allows you to browse data recorded in many different ways.

Other programs offer multitudinous ways of printing data for various needs. LIST combines all of your classes into one roster, broken down by grade level if desired, showing letter grades and percent scores. REPORTS is used when you want to publish profiles of a student's progress for communication to the parents.

I highly recommend Teacher's Pet to any teacher who has some experience with Atari computers. After the initial learning curve, this $50 package will be a great time-saver in handling all the chores involved with student data.

continued on page 22

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INVENTORY MASTER

Reviewed by K.W. HARMS

Royal Software
2160 W. 11th Avenue
Eugene, OR 97402
(503) 683-6620
$89.95, 48K disk

Inventory Master is merchandised as software that lets the small businessman "become a master of inventory control at a very small price." The program's specifications are impressive—1,700 items per disk, 5-second retrieval, multiple vendor history and five standard reports. Unfortunately, I found Inventory Master to be quite limited and awkward to use.

Inventory Master opens with a three-part menu asking you to choose between Inventory, Update and Reports. Each selection includes a helpful description. You indicate your choice by pressing A, B or C (not the first letter of the selection). This loads the "sub-program" and gets you started.

It's also where I started running into trouble. The sub-program presents a nice menu asking you to select an option or to choose "(1-4) CHANGE from disk in drive #1." Since I already had the disk in drive 1, and since the manual says that the "first option you'll want to use is (A)," I did that and promptly bombed. Some six pages later you learn that you always have to choose a drive to load the database. Of course, once you learn that, it's no problem—except waiting for disk reads every time a sub-program is loaded.

Inventory Master uses several odd (to me) conventions. First, it seems to use unconventional control keys. Sometimes a simple [RETURN] shoves you back to a prior choice. Sometimes a [*] and deletion of the automatically prompted characters shoves you backwards. [OPTION] [RETURN] is used to back up a field. [ESCAPE], the nearly universal back-out key, has unfortunately been used to control editing options. A much better choice would have been to use [OPTION] for the editing choices and [ESCAPE] for backing out.

Second, although the basic record contains some 24 fields, you must specify which fields you wish to update/edit each time you begin a session. On one hand, this eliminates going through all the fields. On the other, it's an awkward choice—you often don't know in advance what needs to be done.

Inventory Master makes it easy to change the list of fields to be edited. But in doing so, it often leaves a messy screen—and garbage in an inventory system can cause real problems. It's important to fully verify data before passing them to the file. However, Inventory Master performs only sporadic data edits.

The program readily accepts prices of 6ASD, quantities of 4DE, or invalid part numbers, vendor numbers and dates. The incorrect entries are truncated and added to disk—a 4DE is written as 4. On the plus side, the entry screen is well designed and always tells you what type of data is expected. While adding items, the top part of the screen shows you've already entered.

Inventory Master is bomb prone. It failed often. Each error message attempted to provide a code, such as Er-

ror 166 at line 170. But since the program is unlistable, these were no help. Other errors I experienced included 133, 18 at line 132, runtime error 170 at 30510 and several STOPs. My guess is that most of these resulted from incorrectly trapped bad data.

When an error was reported, Inventory Master's protection system attempted to let you restart or go to DOS. But occasionally, the system locked up entirely. The program's copy-protection could be really awkward if you relied on it for operating your daily business. Royal Software offers updates for $5—very nice if you can afford to be without your program while they exchange disks. Otherwise, one hour of phone support is provided, with additional support at $60 per hour.

Assuming that you can live with all this, what will Inventory Master do? Basically, it offers reasonable but limited capability for the single-site, low volume inventories in small businesses. Part numbers are two alpha characters followed by a number from 1 to 255. Numbers above 255 are excluded by Inventory Master's data compression system.

Although the inventory factors of quantity on hand and on order can go to an adequate 9,999, back-order quantity and reorder point are limited to a mere 255. Description fields are only 25 characters long, so it wouldn't usually be possible to store your vendors' part numbers.

Data can be stored for a maximum of 99 vendors, not enough. Only three vendors can be listed for each item. The vendor information doesn't include name, address, etc. unless you buy Royal's database program. Purchase orders can be tracked to show you what quantity was ordered when and where. Estimated receipt date is not stored. It is possible to issue a Purchase Order (PO) through the system, but this seemed more trouble than it was worth.

The Update sub-program allows "sending" items (recording sales), receiving shipments, and updating sales history. Receiving an item with an outstanding PO automatically clears the PO. Recording sales will prompt you to update the back order quantities. The sales system also lets you create invoices which can be priced at discount or list, and which will include standard headers and footers that you create with a word processor.

These files are called by typing a filename, a procedure which can be awkward. You have to type the customer's name and address—no database is available to store frequent clients. Sales history for six periods is "posted" as you choose.

Reports are simple and available only on the printer. RECOMMENDED ORDERS lists items below minimum which haven't been ordered. As a nice touch, you can have the program calculate required quantities based on your choice of sales periods. FILE RECORD prints a one-line summary per part-number in compressed type font.

The UPDATE FORM report lists part numbers, descriptions, cost lists, discount retail prices and quantities on hand—in three columns for taking inventory. MONTHLY REPORT is a screen display showing a summary of your inventory at "cost," at retail (which is discount price, not list price), month's cost and month's retail (again, discount).

This data arrangement may be useful for some purposes, but it cannot be used for tax or financial statements since it does not follow accounting conventions.

Overall, my judgement is that most business users will find Inventory Master extremely quirky and frustrating to operate.



WRITE FILE, HOME OFFICE

Reviewed by STEPHEN ROQUEMORE

International TriMicro, Inc.
14072 Stratton Way
Santa Ana, CA 92705
(714) 832-6707
$29.95 each, 48K disk

These scaled-down integrated programs feature a scaled-down price. But you get what you pay for—a system that is short on features and limited in capacity.

Each disk contains the same mini-word processor program combined with either **Write File**, a *mini-database filer program*, or **Home Office**, a mini-spreadsheet. A Commodore 64 version is on one side of the disk, Atari is on the other. Unfor-

continued on next page

tunately, the term "integrated" does not apply fully to the Atari version.

The manuals are poorly written, and the "Addendum Sheet" used for Atari command equivalents makes it difficult to use this basically simple program. No quick reference or index is supplied, either.

The built-in word processing program is adequate for writing letters or small memos. But for any complex task, a full-featured word processor would be necessary. The word processor allows chaining of files, search-and-replace and block moves. It can handle 99 lines of as many as 77 characters each. One of the integration features is embedding part or all of the Write File database or the Home Office spreadsheet. Print formatting is very good, allowing extensive control of printers with special features.

The Home Office spreadsheet is easy to use and does everything most larger spreadsheets do. But, like the word processor, in a smaller capacity. It provides 50 rows and 17 columns of cells which can contain text, numbers or formulas.

You can save a range of cells to disk for inserting into a word processor file to print. Entering data into cells is easy, *if* you enter a command to set the mode to text, numeric, or formula, then enter all of the numbers, switch modes and enter the formulas. Do it any other way, however, and you get very frustrated with having to change modes for each cell encountered.

The Write File database program is an adequate filing system for small applications like address files and recipes. It holds up to 999 records in a file. Editing, searching, and sorting of records are available. You may also merge files into the word processor file for printing.

These programs are designed for the Commodore 64 and in the Atari version, several features simply do not work. The manual states "since the Atari does not have as much memory as the Comodore 64," the user must choose which program to load after the main menu appears! The windowing feature is disabled for all the programs for the same reason. The Transfer commands send you to the Main Menu, instead of loading the requested program.

Write File uses a hidden-directory scheme and formats the disk before setting up a new file. This means if you have any files on the same data disk, you will lose them! Thus you must put them on a separate data disk, or add them after you set up the disk as a database disk. The Home Office will allow you to have word processor and spreadsheet files on the same data disk.

I don't recommend Write File and Home Office unless you don't need the "integration" of the two programs. The price is attractive, but poor documentation makes these programs too difficult to use.



PEACHTREE'S BACK TO BASICS

Reviewed by K. W. HARMS

Peachtree Software, Inc.
3445 Peachtree Road N.E.
Atlanta, GA 30326
(404) 239-3165
48K, 2 disk drives
$195

Starting your own business was risky—so risky that you still wonder how it all worked. Although the company seems to be generating steady sales, you need help!

Last year's tax preparation was a mess. Now the bank wants regular statements. And your accountant insists it's time to get your records out of the shoe box. Of course he'd gladly do that for you at (ouch) $30 per hour.

Your friends insist you have to shell out $5,000 for an IBM PC and the latest accounting software (plus probably a consultant to install it). Frankly, $5,000 would look more impressive dressing up the store than buried in the back office.

But wait—hold onto your charge cards. Finally there is true small-

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business accounting software for your Atari. It's the **Back To Basics** Accounting System from Peachtree Software, the well-known Atlanta publisher of business applications. And it costs only $195.

Back To Basics is also available for the Apple II, Macintosh, Commodore and IBM PC. The Atari version will run on any 8-bit model with 48K memory and two disk drives. It provides the accounting services most cash-oriented small businesses need—Accounts Receivable and Accounts Payable systems linked to a double-entry General Ledger.

The program produces attractive 80-column printed reports. I found that setting it up for a printer was virtually automatic and foolproof.

The comprehensive (if slightly intimidating) 350-page manual starts you off with a 66-page introduction to basic accounting practices. It won't make you a CPA, but you'll be ready to tackle the accounting needs of a reasonably active business.

INSTALLATION

First you have to install the system. This means you provide the data for all three programs.

General Ledger installation lets you choose options to summarize sales, cost of goods sold, assets, liabilities and equity. Installation will probably take two to four hours, assuming that you have a tax return or trial balance to start with.

Accounts Receivable and Accounts Payable ask for the formats of customer and vendor account numbers, and whether to integrate these systems into the General Ledger. This installation process is simple, but could take quite a while if you have large numbers of customers or vendors to insert.

All three systems create their own data disks—Peachtree recommends using three disks monthly per application. That's nine disks a month, but you can recycle the Payables and Receivables disks after finishing the monthly General Ledger posting.

Each step of the installation process is menu-prompted and the system methodically forces you to complete a step before moving on to the next. You are often prompted to save your data to disk. All this consideration is typical of the solid, helpful programming you'll find throughout Back To Basics.

Little details are carefully monitored. Did you insert the system disk instead of a blank? Back To Basics will tell you. Did you insert a partly used disk which would not have room for all the data? Back To Basics automatically reformats it.

And if you (like me) refuse to memorize a chart of accounts, pressing [?] when entering an account number displays the entire chart. However, there is no other online help.

GENERAL LEDGER

The General Ledger follows a standard structure—asset, liability, equity, income, expense. It uses four-digit account numbers, and the last of these digits can track as many as 10 departments. If this multi-department option is chosen, separate income statements are produced as well as a consolidated statement. A total of 254 accounts are allowed, which should be enough for most companies.

The previously mentioned four-hour General Ledger installation time also assumes that you accept the standard chart of accounts with only a few modifications. Deleting accounts takes nearly a minute per account, but adding or changing accounts goes considerably faster.

Entering an account number causes the system to automatically display the account name, a nice verification feature.

Journal entries include a reasonable description space and allow up to 21 lines per entry. Any number of automatic entries can be set up and executed each month in a single batch. This is a real work-saver for depreciation, writing off prepaid expenses, allocating rent, etc.

Cash sales procedures are extraordinarily well-done. The program helps you set up a manual cash drawer reconciliation form for day-end cash counting. It then automatically posts each account, even cash "over/short".

Professional-looking general ledger reports cannot be "printed" to the screen but can be produced in hard copy for any period of the month. Reports choices include: Chart of Accounts, Trial Balance, Detailed General Ledger, General Journal, Cash Disbursements Journal, Cash Receipts Journal, Cash Sales Journal, Income Statement, Balance Sheet and Check Register.

Account Activity Reports show all transactions for the account and are used in reconciliations. This works well, but could have been more useful if the program let you specify a range of accounts rather than one-by-one, and if the reports included more than one account per page. You end up using a lot of paper to print less active accounts.

ACCOUNTS RECEIVABLE

Back To Basics receivables uses a "balance forward" system. Individual invoices are not marked off as paid. Yet it does allow some flexibility to apply payments to various posting periods (60 days, etc.). It also allows up to three cash accounts.

It accepts three sales tax rates which are automatically computed on each invoice. Finance charges are also computed automatically. Each customer can be granted one of 10 terms under which finance charges are figured.

The system also allows for cash discounts. Customers with old balances can have one of 10 dunning notices added to statements.

Invoices, however, are not produced by the system. You write up the invoice and give it to the customer in the store, then record invoices again on the computer. This fits many retail shops, but probably would not be appropriate for mail order companies.

The system won't adjust or track inventory, or perform "order entry" functions (tracking orders received but not delivered). It's a basic Accounts Receivable system for basic businesses.

Within that realm, Back To Basics functions quite well. For each customer it stores the name, account number, address, ZIP code, phone number, credit limit, terms granted, tax status, finance charge status, and year-to-date balances.

Data entry is as painless as possible.

Entering a [?] in the customer account number brings up a list of customers. The system quickly brings up a customer's information on the screen—a real time saver when you're answering phone calls in the middle of the month.

Reports include a Customer Master List, a Detailed Accounts Receivable Ledger (dated listing of balances and transactions by customer). Accounts Receivable Summary, Sales and Payments Journals (list of payments and sales credited by date), Finance Charges Journal, Accounts Receivable Aging, (simple list by customer, of current through 90-day balances), a Customer Master List (useful for sales people on the floor), Customer Statements (these can be printed on stationery to fit window envelopes) and even mailing labels.

It can accommodate over 200 customer accounts and allows mid-month posting if the disk gets filled with transactions.

ACCOUNTS PAYABLE

The Accounts Payable module operated as smoothly as the rest of the system. Detailed data about vendors is provided, manual checks, vendor's debit, credits and invoices can be entered. The system can be linked to the general ledger to automatically update accounting information.

Each payment can be distributed to up to 15 General Ledger accounts. Additions, deletions, and modifications to the prior chart of accounts are allowed. This will be a lengthy process. You only need to do it once, however.

The system also allows for up to three checking accounts and produces computer-generated checks and descriptive check stubs for each in separate batches.

Accounts Payable reports can be run for a range of vendors including: Vendor Master List, Payable Ledger, Purchases Journal (forecasts cash discounts and discount dates), Accounts Payable Disbursement Journal (vendor-by-vendor listing of checks issued, invoice paid for each vendor, discount taken), Open Invoice Register (projected discount dates and amounts).

The Cash Requirements Report is the hot one. It uses projected payment dates and a "pay through" date (i.e., pay everything due through July 1) to project discount and payment amounts. You can therefore anticipate how much cash will be needed. This report can be re-run until the total comes close to the cash available. The system also prints out individual checks, a Check Register and a Chart Payments List.

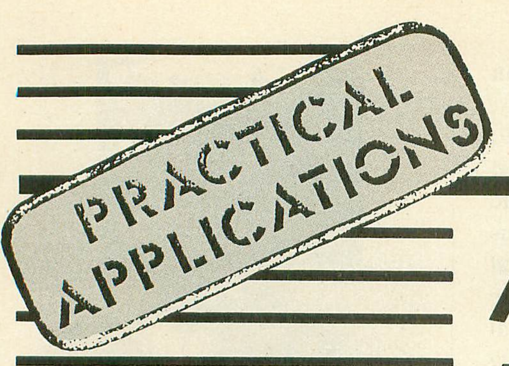
The Accounts Receivables and Accounts Payable systems are very similar, both handle over 200 vendors/customers. A mid-month posting is available. If you are concerned about whether Back To Basics can handle the demands of your business, by all means phone Peachtree customer service before you buy.

BOTTOM LINE

Generally, the Atari is up to the challenge of this complex system. But it requires frequent disk reads and we all know how slow Atari's disk is! You'll also face some disk swapping. In my opinion, the amount is reasonable. No more than four or five swaps per session. The biggest delay is the 20 seconds it takes to update the file after each transaction or master record change. This is a real drag.

Although Peachtree provides free support for 90 days and is concerned about data backups, the company only protects program disks under a policy of "send in your damaged disk and we'll send you another one." Since you'll be relying on this system for critical information needs, this policy is simply not adequate.

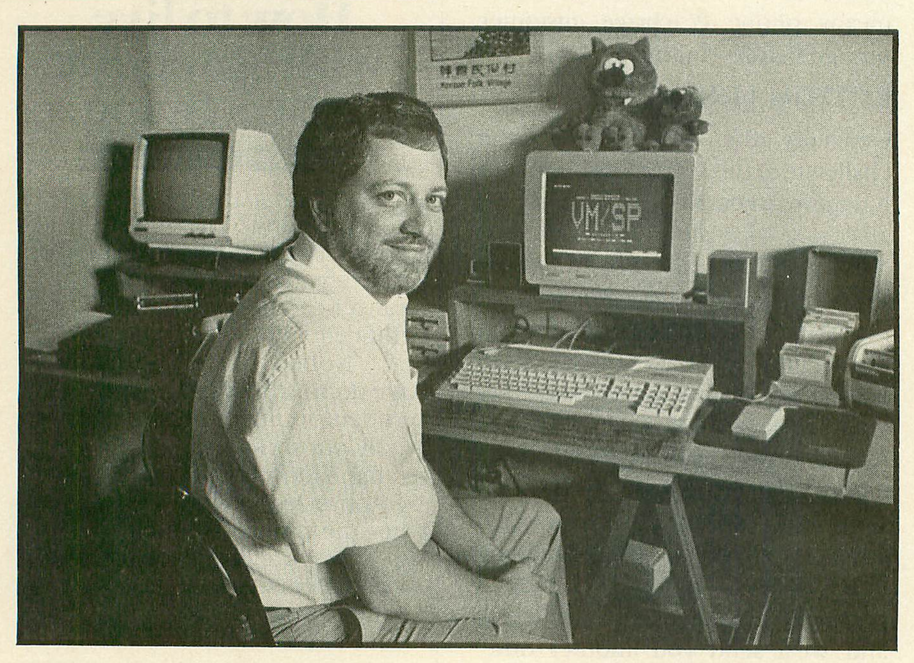
All things considered, this software should cut way down on those expensive calls to your CPA. Back To Basics is basic and it's very well-done. If your business isn't too large to fit into this system, the software is well worth the $195 price.



ATARI AT WORK

Practical applications from imaginative Atarians

by GIGI BISSON, **Antic** Assistant Editor



By emulating the office's VT52 terminal with his 520 ST, Frank Nagle can access the company mainframe at home.

Photography by ERIK WEBER

Use a little imagination . . . and Ataris can do anything. I set out to find practical Atari owners, on an electronic quest via CompuServe e-mail and telephone that sent me to offices, laboratories, garages and living rooms across America.

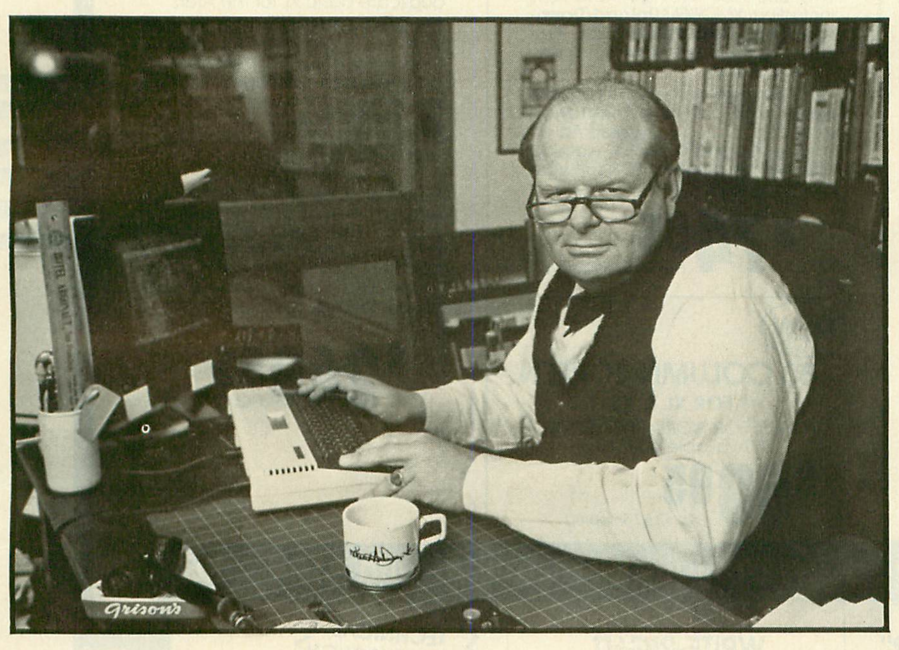
The discovery? A computer doesn't have to crunch numbers and crank out spreadsheets at large corporations to be "practical." A practical application might be anything that gets the job done faster, better and more efficiently than it could be done without a computer.

The uses range from fascinating to bizarre to mundane. All of the people in this story have just one thing in common—Atari computers. Some of these folks even swear they'd be out of a job if their Ataris didn't work so hard.

ATARI ORGANIZATION

It's no surprise that Atari users groups use Atari computers for everything from newsletter writing to mailing lists. So do users. In fact, newsletter production and keeping track of church or club activities are some of the most common Atari productivity uses.

James Porta, the Financial Secretary and Treasurer of Ironworkers Union Local 718 in Wheeling, West Virginia uses SynCalc and SynFile+ to keep track of members' records, cash receipts and disbursements, and to create Department of Labor reports.



Robert Dewey uses an 800XL and Paper Clip to create professional copy for the Lowry and Partners public relations agency.

He does it all on an Atari 800 with double Percom disk drives and a Panasonic KX printer.

Daniel Warner Rhea uses his Atari to prduce the Browbeat, a newsletter for a local chapter of Mensa, the high-I.Q. social organization. He writes it with the PaperClip word processor, creates subscription lists and maintains directories of local members with SynFile+.

ATARI HOME OFFICE

As one reader anonymously wrote on the back of an **Antic** survey form (see January, 1986 issue), "My wife and I depend upon the Atari to run our mail order business. We use Text Wizard for correspondence, SynFile+ for labels on 1,000 bulk mail pieces a month, Print Shop for fast and dirty handouts and Atari Bookeeper to track our cash flow."

Like many Atari owners, Paul Maycock originally bought an 800 for his children to play games on. Now, the kids don't have a chance. As president of Photovoltaic Energy Systems, Inc., Maycock has been working out of his Alexandria, VA home for five years—on the same Atari he bought for the kids.

Maycock has written several books including *Sunlight to Electricity In One Step,* published by Brick House Press, *Guide to the Photovoltaic Revolution* by Rodale Press, and the self-published *Photovoltaics in Japan—America Challenged.*" He uses the Atari mainly as a word processor. His software of choice is LJK Letter Perfect—Version 6. He uses Letter Pefect to store 1,000 records of his newsletter subscribers, and prints labels with a Star Gemini 10-X dot-matrix printer.

With the Atari, Maycock also edits "PV News," a monthly newsletter for the photovoltaic industry, a specialized branch of the solar power industry dealing with the conversion of sunlight to electricity. His writing and consulting services now gross about $250,000 a year, and he still does nearly all of his work on that original Atari 800.

ATARI VIDEO

Not all practical uses are limited to commercial software. For example, the Atari's many graphic modes make it a great video titler. Lee Whiteside uses his Atari with his VCR deck to make short films and music videos. He uses the Video Easel cartridge to generate a black screen for playing between segments of his recorded video and film clips—much more attractive than video noise. He even uses the Atari to print labels for videotapes. "I also used my video equipment and Atari to videotape my high score on M.U.L.E. so I could make a picture of

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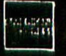
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it to send in to get a M.U.L.E.Skinner Certificate," says Whiteside. He is currently the second highest scoring M.U.L.E. player.

The Atari may even have commercial video applications. Lee Smith of Ohio designed a package enabling cable TV operators to use the Atari for creating program announcements. He used the Atari's graphics capabilities to power an $800 system that replace a $10,000 dedicated machine.

ATARI COMMUTING

Frank Nagle is President of BAAUG, the Atari users group that serves the Silicon Valley area. He also works works for Sygnetics, a Silicon Valley microchip manufacturer. However, most days Nagle doesn't fight the valley's notoriously crowded freeway traffic to get to his job. He stays home and uses his 520ST to emulate a VT252 mainframe terminal and access the Sygnetics system. "It saves me half an hour commuting each way," he says.

Another BAAUG member, Dr. Bill Lynch, has put eight 520STs to work at San Francisco Veterans Hospital in a rehabilitation program.

DEDICATED ATARI

With the 128K-memory Atari 130XE so inexpensively priced, why not put one to work at a single, dedicated task? George Lentz, of Toms River, NJ is an electronics engineer at Van Kel industries in Edison, NJ. He is responsible for the design of electronic test equipment used in the pharmaceutical industry.

Van Kel, a fairly small company, couldn't afford a dedicated 6502 microprocessor development system. So Lentz brought his Atari 800 to the office and hooked it up to an Eprom programmer and simulator through the RS-232 port. By using MAC/65 and writing an extensive BASIC program, Lentz put together a development system. "Our Atari system is not so fancy, but it's very economical and it's doing a great job," he says.

DR. ATARI

'I use Atari 800XLs professionally," says Gary Holder, a PhD candidate in neuropsychology, "In fact, that's how I got into the Atari world in the first place." Holder uses Ataris in the Cognitive Neurophysiology Research Facility at the Knoxville Memorial Research Center and Hospital of the University of Tennessee.

The research facility first purchased the Ataris for Cognitive Rehabilitation. This field involves the use of computers as a part of a rehabilitation program for people with thinking problems resulting from head injury, stroke or other brain-damaging disorders. The computer is used as a sort of surrogate therapist, available to the patient 24 hours a day at home.

The lab's main research efforts are focused on the study of computer-analyzed brainwaves (electroencaphalogram or EEG). The EEG analysis is actually done by a PDP-11 computer. But after struggling to create a visual simulation of flashing EEG wave patterns on the PDP-11's $3,000 512×512 pixel, 256-color RGB monitor (which required assembly language programming), he realized that the Atari could do the same job with simple BASIC programming.

The center's 800XLs are used for monitoring any EEG changes that occur during the period of rehabilitation, which may last from six months to two years. "For example, do brainwaves become more normal as the patient improves? We have no definitive answers to that question. . .yet," he says. But with the help of the Atari, he may soon know.

ATARI FOR DISABLED

Gerry Feid of Chicago has been 100% disabled with rheumatoid arthritis since 1975. His Atari 800 is named Betsy, and he says, "By using Betsy, my brain was restarted. I realized just because I am disabled, that doesn't mean I am a human vegetable."

Feid joined the CLAUG and MACE Atari users groups, and has become particularly active with their bulletin boards and newsletters. He was one of the user volunteers manning Atari displays at last summer's Consumer Electronics Show. In addition, he has returned to college, started regular physical workouts, and was appointed to a local government committee for the handicapped.

PUBLIC RELATARI

Robert Dewey is still trying to convince the rest of his partners at Lowry & Partners, a San Francisco public relations agency with clients such as McDonald's Corp., to ditch their antiquated typewriters for Atari computers.

If anybody ought to know whether Atari computers are capable of running a whole office, it's **Antic**. Our visitors are often surprised to see so many Atari computers on desks here.

Antic's 16 Ataris are used primarily for word processing. The editorial staff uses PaperClip from Batteries Included (a few diehards still refuse to give up AtariWriter). Our 8-bit Ataris and 520STs are also put to work programming, reviewing program submissions and commercial software, printing the published listings—and occasionally playing games during lunch breaks.

As you'd expect, many **Antic** employees have their own Atari computers at home and log onto CompuServe or communicate with the office online. (Charlie Jackson recently hauled his Atari 800, disk drive and modem as carry-on luggage during a trip to New York, so he could send us e-mail.) When there's no time to wait for the U.S. Postal Service, **Antic** authors transmit their stories and programs online.

I am writing this article on an Atari 800XL computer with PaperClip software. When I'm finished, I'll pass the disk to my editor, who makes all revisions electronically. Then the disk goes to the art production coordinator, who inserts typesetting codes into the file and transmits it directly to our typesetter service via modem. There, their copy of the disk file will be loaded into a computerized phototypesetting machine that produces the actual typographical characters you are reading right now.—GIGI BISSON

While the agency did PR for Atari during the reign of Ray "The Czar" Kassar, they were given a few Atari computers. Dewey was interested in using a computer to maintain a contact file of some 6,000 publicity outlets to receive media releases.

Existing Atari databases didn't allow enough space for names and titles of both reporters and publications. So Dewey, who had no programming experience whatsoever, read a book on programming and created his own database software. He now writes all his press releases and correspondence with the PaperClip word processor on an Atari 800XL and a dot-matrix printer.

"I only use my old 1924 Underwood for the one thing PaperClip can't do—addressing envelopes," he says. Dewey also uses an Atari computer to get online with Dow Jones and The Source for research, and he uploads press releases directly onto the Business Wire, a public relations wire service.

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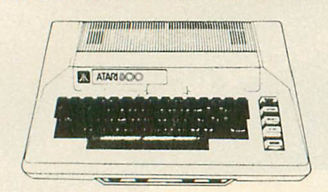
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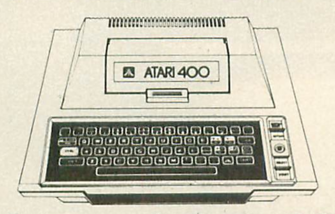
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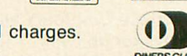
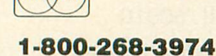
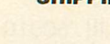
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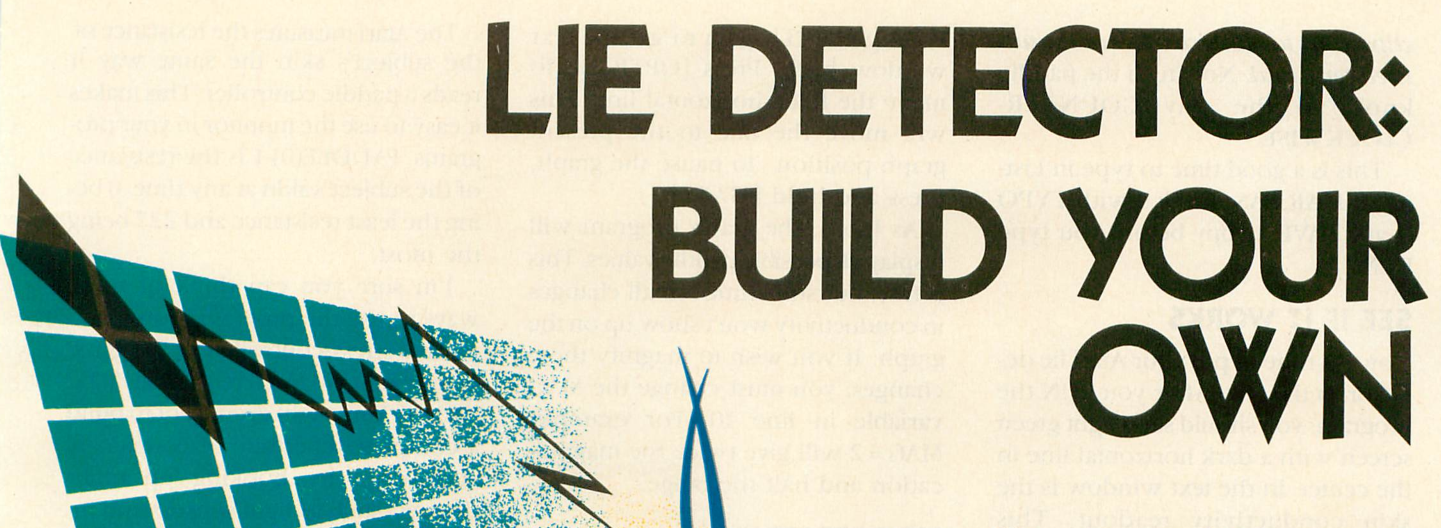
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LIE DETECTOR: BUILD YOUR OWN



State-of-the-art Sherlock Holmes

by MICHAEL KRUEGER

Never again will you need to jump the gun when making accusations. Just round up a set of Atari paddles, some insulated wire, a phillips screwdriver, a pair of needle-nosed pliers, two pieces of aluminum foil, two rubber bands, four alligator clips, any Atari computer and your favorite pathological liar. That's all it takes—plus this BASIC program—to build your own biofeedback monitor lie detector. You don't need to know how to solder, and you don't have to worry about "frying" your computer (or your suspect!) if you make a mistake. However, ***Antic*** *assumes no responsibility for improper or irresponsible use of this project.*

It was one of them dive neighborhoods so bad, even the crooks drove around in police cars. I brought Mark "The Shark" Quark to Ace's Bail Bonds and Bar and Grill to get the bird's eye lowdown. I cased out the joint. It was so sleazy, even the guns had guns. I pulled "The Shark" into the back room.

"Where were you on the night of November 20?" I asked.

"Get that bright light out of my eyes," he said.

"I have ways of making guys like you cough up the cold, hard facts," I said. "They don't call me the Lie Detective for nothing." I whipped out my secret weapon.

"Aaaaaaggh!" he screamed. "Not an Atari computer! A Trash-80, an Adam, a Commodore Amiga, ANYTHING but . . ."

Gone were the days when the tools of the detective's trade consisted of little more than a trenchcoat, a notepad and a well-oiled revolver. I knew I hadn't wasted my time typin' that short listing and checkin' it with TYPO II. I wrapped the electrodes around his fat fingers. And I'll tell ya, he talked all right, he spilled his guts . . .

COLD, HARD FACTS

First, make two electrodes to be attached to the fingers of your willing "subject" (or suspect, if applicable). Cut two pieces of insulated electrical wire in two-foot lengths, and strip the ends of each piece. Attach alligator clips to both ends of each wire.

Cut two 4×5 inch rectangular sheets of aluminum foil. Lay one sheet flat with the shiny side down, and fold it in half lengthwise. Now fold it in half crosswise, twice. You should have a shiny pad about 1 1/4 inches wide by 2 inches long. Repeat these steps on the other piece of aluminum foil. Attach one alligator clip from each wire to the short edge of each electrode. Now you're ready to hook the electrodes to the paddle controller.

First some detective work. Figure out which paddle controller is paddle 0. Plug the paddles into joystick port 1 and sit in front of your computer. The cord coming out of the *left* side of the paddle plug goes to paddle 0. On an Atari XL, it's the cord *nearest* you. With a phillips screwdriver, remove the back cover of paddle 0.

Inside you'll find a little switch, a red plastic button, some wires, and a circular component with three terminals on it. It's called a potentiometer, or "pot" for short. There are wires soldered to two of the pot's three terminals. Clip your alligator clips to these two terminals. *Make sure the*

continued on next page

clips don't touch each other or the unused terminal. Now turn the paddle knob all the way COUNTER-CLOCKWISE.

This is a good time to type in Listing 1, LIAR.BAS, check it with TYPO II and SAVE a copy before you type RUN.

SEE IF IT WORKS

Now it's time to put your Atari lie detector to the test. After you RUN the program, you should see a light green screen with a dark horizontal line in the center. In the text window is the skin conductivity readout. This should read 000. If it reads 227, your electrodes are probably touching. Separate them. If it still reads 227, check your alligator clips. They shouldn't touch each other or the other terminals on the "pot". If you still don't get 000, make sure the paddle knob is turned all the way counterclockwise.

THE REAL TEST

Wrap the aluminum foil electrodes around any two of your "guinea pig's" fingers. NOTE: If the electrodes touch each other, it will throw the readings off. You can eliminate this problem by placing them at least one finger apart.

The electrode should face the "sweaty side" of the finger, not the fingernail side. Secure each electrode with a rubber band, but not too tightly. . . you don't want your subject's fingers to fall off! Most people won't feel the five volts of current that runs though the paddles. However, if your subject feels anything more than a mild tingling, *disconnect the paddles IMMEDIATELY* and check to be sure you assembled the project correctly.

The graph on the monitor should now show the approximate stress level. Skin conductivity will increase if the person is nervous or physically active. Jogging in place will usually send the graph up, relative to how out of shape the subject is. As the person relaxes, skin conductivity will decrease, and the graph will fall.

The bottom 32 lines of the graph are hidden by the text window. If you wish to see them, press [SELECT]. Press [SELECT] again to get the text window back. Press [OPTION] To move the fixed horizontal line. This will move the line to the present graph position. To pause the graph, press and hold [START].

As listed, the graph program will display all possible paddle values. This is fine, but sometimes small changes in conductivity won't show up on the graph. If you wish to magnify these changes, you must change the MAG variable in line 10. For example, MAG=2 will give twice the magnification and half the range.

LIE DETECTIVE

The biofeedback monitor and the graphing program can be used together as a simple lie detector. To do this, the person being tested should look away from the screen. Ask the person a few unimportant questions, and press [OPTION] to mark their stress level. If the graph rises far above the stationary line, they may be lying. If it rises off the screen, you may well suspect that they're telling a whopper.

This test works better if the subject knows the wording and order of all the questions in advance. However, remember that your simple "lie detector" is much more inaccurate and easier to fool than a polygraph, the expensive machine normally used to give these type of tests.

HOW IT WORKS

The principle behind the biofeedback monitor is simple. The "pot" in the paddle controller is a "variable resistor." In other words, its resistance to an electric current can be changed by turning the paddle knob. The Atari has circuitry in it to measure this resistance and convert it into a number, which can be read using the PADDLE(x) function of Atari BASIC.

When you hooked your electrodes to the paddle contoller, you added another variable resistor to the circuit—the skin of the subject! When people get nervous, perspiration forms on their skin, making it more conductive (resistance decreases). As people relax, they perspire less, and their skin becomes less conductive (resistance increases).

The Atari measures the resistance of the subject's skin the same way it reads a paddle controller. This makes it easy to use the monitor in your programs. PADDLE(0)-1 is the resistance of the subject's skin at any time, 0 being the least resistance and 227 being the most.

I'm sure you can think of more ways to use the program. You could write a stress-controlled video game or a program to teach relaxation. Who knows? You might even want to build a complete repertoire of counterspy accessories by hooking up other devices, such as light sensors and infrared detectors, to the paddle controller circuit.

TECHIE STUFF

Most BASIC graphics modes include a four-line text window at the bottom of the screen. Adding 16 to the Graphics mode will give you the same type of screen without a text window.

For example, a Graphics 8 instruction will create a Graphics 8 screen with a four-line text window at the bottom. A Graphics 8+16 instruction generates a full Graphics 8 screen.

Normally, every standard GRAPHICS call from BASIC clears the screen, even if you're just adding or removing a text window. This program, however, features a seldom-used technique for adding and removing a text window without erasing the graphics.

Line 120 contains a Graphics 8+32 instruction. The "8" part of the instruction tells the computer to build a Graphics 8 screen with a text window, and the "+32" tells the computer to preserve any graphics already on the screen. This instruction can also be written as Graphics 40.

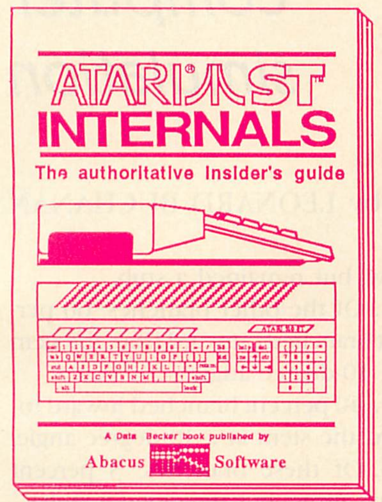
The Graphics 56 instruction in line 110 is equivalent to a Graphics 8+16+32 call. The "8+16" part of the instruction tells the computer to build a Graphics 8+16 screen (no text window). Again, the "+32" tells the computer to preserve whatever graphics are on the screen.

Michael Krueger, 15, is a sophomore at Vermillion High School in Vermillion, South Dakota.

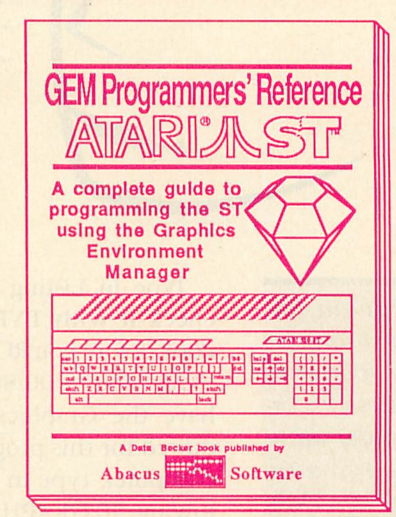
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THE ATARI® ST™

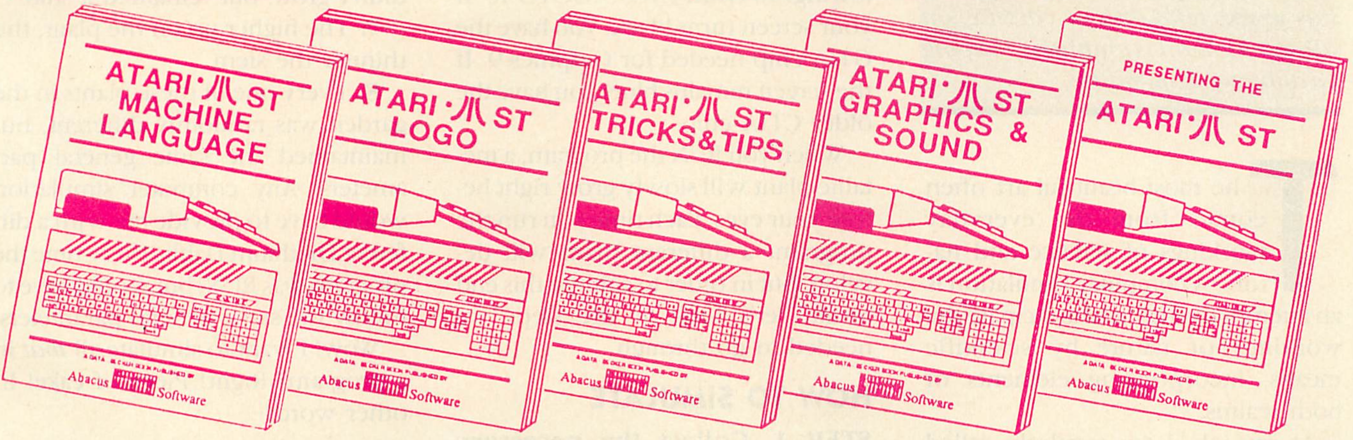
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DIGITAL DILITHIUM DAHLIAS

How to program a computer simulation

by LEONARD BUCHANAN

Computer simulations are an important practical application for science and industry. The following article demonstrates the steps involved in creating a computer simulation of how plants would grow on an all-metal planet. Dilithium Dahlias works with disk or cassette, on all Atari 8-bit computers having Graphics 9 capability.

The most beautiful art often comes from the everyday workings of science and nature. A computer simulation is an attempt to copy and anticipate the workings of nature by scientific means, incorporating elements of both realms.

At my job, I am regularly called upon to make up computerized simulations for various new ideas. I have found that I follow a fairly set routine in doing so, and would like to share it with you.

For this simulation, I chose a type of plant from my wife's flower garden and decided to find out what this plant would look like if it had grown on another planet—say, a planet where everything is made out of metal.

Type in Listing 1, DAHLIAS.BAS, check it with TYPO II and SAVE a copy before you RUN it. NOTE: Some older Atari 400/800 models *don't* have the Graphics 9 capability required for this program. To test your computer, type in and RUN the following: 10 GRAPHICS 9:GOTO 10. If your screen turns black, you have the GTIA chip needed for Graphics 9. If the screen remains blue, you have the older CTIA chip.

When you RUN the program, a metallic plant will slowly grow right before your eyes. Each time you run the program, a different plant will develop. But in order to achieve this end result, let's look at the steps we needed to go through.

HOW TO SIMULATE

STEP 1. Collect the necessary data. To start, I measured every inch of the plant, and compressed the important elements of its form into numbers, as follows:

1. For every millimeter of plant height, there was a branch 14 percent of the time.

2. The first branch was always a double branch (left and right) on every such plant in the garden.

3. If a branch began within 10 mm of an already existing branch, it didn't grow, but remained a stub.

4. Of the other branches, 60 percent branched outward from the stem at a 30-degree angle.

5. 40 percent branched inward toward the stem at a 10-degree angle.

6. Of these branches, 3 percent didn't grow, but remained a stub.

7. The higher up on the plant, the thinner the stem.

8. Every one of these plants in the garden was randomly different, but maintained the same general parameters. Any computer simulation would have to provide me with a different Dilithium Dahlia every time the program was RUN, but would have to follow the same general parameters.

Wow! I want to simulate all *that* in a program? Right! Piece of cake! In other words:

STEP 2. Don't allow the task ahead of you to be greater than the enthusiasm behind you!

STEP 3. Think through what you want the program to do:

When I start a simulation, I find it easiest to first make up a general outline of the whole program in REM statements, so I will know what is necessary at any given time.

This also helps if you cannot write the whole program in one sitting. In

the Dilithium Dahlias listing, note that the REM statements are all in increments of 10, and the program lines are written between them. Luckily, in this one, the program lines fit. If they don't, you just have to renumber.

Note that a few of the 10-step increment groups are not there. Often, after you begin to write the program, you will see that you can delete steps which seemed important when you were doing your outline.

Note also the use of well-named variables for the major portions of the program. By using these you can renumber at will, and just change the value of the variable, without having to go back through your program to check every line for GOTOs and GOSUBs.

This also makes the program easier to read if you refer back to it at some later date. When you assign the variable values for all GOTO and GOSUB routines, be sure you do not assign the value of your REM line. That way, the REM line can be removed later, to streamline the program.

STEP 4. Write the main programming lines to meet each REM line (without getting fancy):

To begin this simulation, I just looked at each REM line and wrote programming below it which would do what was requested. I usually go straight through, without RUNning the program, and write all the code at once.

STEP 5. See if it works (it won't!) or why not:

The best laid plans of mice & men . . . Well, you know. From here, just work on the program to get it to do what you need it to.

STEP 6. Once it does work, improve it:

Any good programmer, looking at the enclosed listing will immediately see a thousand ways to streamline it (get rid of the REM lines, etc.), enhance it (add a title page, more colors, etc.), and generally make it more professional.

Please feel free to change this program any way you want, and to call it your own. I have left the program at this stage of development so you can do just that. In fact, I have always felt that one of the best ways to sharpen your programming skills is by RE-programming something which already works. It allows you to play around with things, and see immediate results.

Once you have improved this program to your own satisfaction, think up a simulation of your own. (Martian animals? Underwater jet planes?) Once you have tried a few, you'll see a new world of programming capabilities opening up to you.

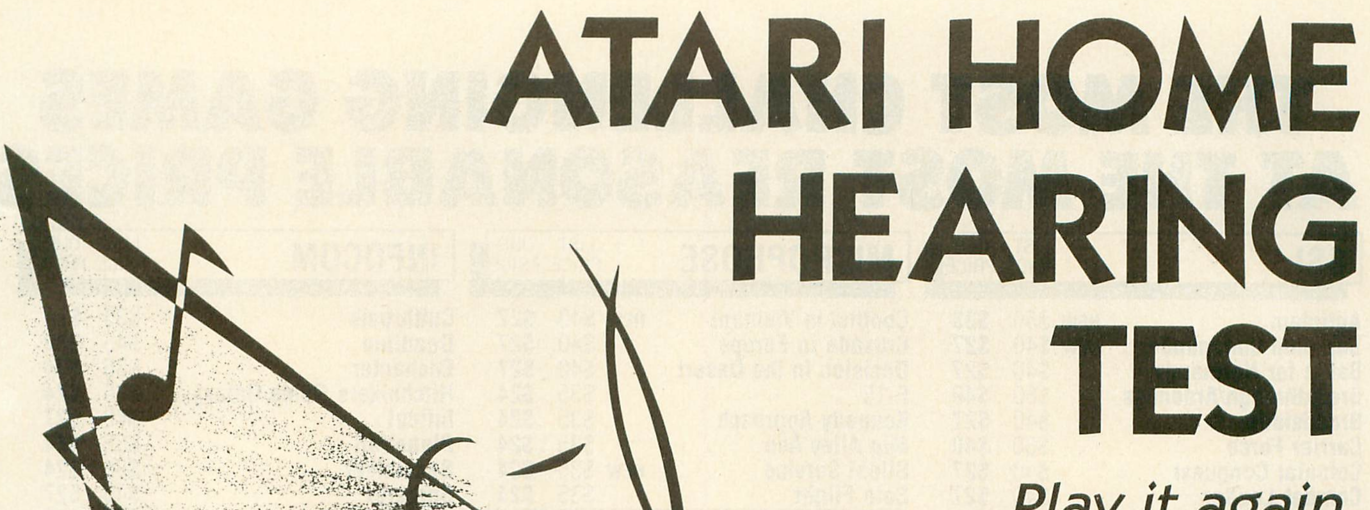
Leonard Buchanan is Computer Operations Manager for Secure Systems Planning and teaches Computer Science classes at Anne Arundel Community College, Annapolis, MD.

Listing on page 89

ATARI HOME HEARING TEST

Play it again, computer!

by CHARLES JACKSON



Your Atari can test you for pitch hearing, just about like those grade school tests. This short BASIC program works on all Atari computers of any memory size, with disk or cassette.

Remember when you were in second grade and they sent you down to the school nurse's office for a hearing test? The nurse seated you at a desk, shoved big gray headphones over your ears and fiddled with console knobs like a mad scientist

Relive those golden days of elementary school by taking your own Atari Home Hearing Test. Or inflict the experience on somebody else.

SAY WHAT?

Type in Listing 1, HEAR.BAS, check it with TYPO II and SAVE a copy before you RUN it.

This test measures high frequency hearing responses just about the same way as your old school test. It starts by playing a pitch so high only your dog can hear it. Then gradually the pitch is lowered. Signal with your joystick when you can hear the pitch. This will stop the descending tone. (Make sure your video volume is turned up loud enough so you can hear the test tone.)

HEARING PITCH

The human voice sings within the range of about 50 Hz to 1 kHz. (Hz stands for hertz, a unit of measure equal to one cycle per second.) A bird whistles above 3 kHz. A truck rumbles below 10 Hz.

People can hear from about 20 Hz to 20 kHz, depending on their age and the sound loudness. Children can usually hear higher pitched sounds than adults. If you've been to too many heavy metal concerts lately, you may have experienced some high frequency hearing loss.

HOW IT WORKS

The Atari has three internal clock frequencies, 15 kHz, 64kHz, and 1.79 MHz. Humans can't hear the 1.79 MHz or 64 kHz clocks directly, but all of the clocks can be used with the SOUND command.

The built-in sound generators can be accessed in BASIC with the command SOUND A,B,C,D, where B is the pitch, or frequency value. But sometimes using the SOUND command resets some of the parameters, like the clock. So it is useful to change frequencies without using the SOUND command.

This program changes the pitch by POKEing 53760, which controls the frequency for voice 0.

The frequency is found by dividing the clock frequency by twice the value placed in parameter B of the SOUND command. This is calculated in line 50 of the program. For example,

SOUND 0,145,10,10

plays the pitch A = 220 Hz, when the clock is set to 64kHz. (64 kHz = 64,000 Hz, 64,000 Hz/ 2 / 145 = 220 Hz.)

Clock frequencies can be changed by poking address 53768 (dec) with:

0 for 15 kHz clock
1 for 64 kHz clock
32 for 1.79 MHz on channel 2
64 for 1.79 MHz on channel 0
96 for 1.79 MHz on channels 0 and 2.

*Charles Jackson of Santa Monica, California is not **Antic** Program Editor Charlie Jackson.*

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STICKWRITER

Joystick-controlled word processor

By BILL LUKEROTH

A simple and reprogrammable word processor that's operated entirely by joystick—for the disabled who can't operate a keyboard. The BASIC program works on all Atari computers of any memory configuration, disk or cassette.

Computers are a boon to the deaf or speechless because they allow communication with the world via the keyboard. But what of those who are physically unable to type? Victims of stroke or muscular dystrophy may be left with mind intact but little motor control.

This problem struck home when my father faced delicate brain surgery and was warned that the operation could potentially cause problems exactly like those just described. I knew this possibility had to frighten him, so I set out to see what the Atari and I could do to help.

Luckily, my father didn't have to use the program, but I present it here in the hope that it will be useful to others.

Stickwriter is a joystick-controlled method of creating text by linking together words and letters chosen from a screen menu. If necessary, a head harness or similar apparatus could be designed to emulate a joystick.

USING THE PROGRAM

Type in Listing 1, STIKWRIT.BAS, check it with TYPO II, and SAVE a copy before RUNning it. Note that in line 920 the sixth "word" in the DATA statement is actually a blank space.

When you RUN Stickwriter, after a brief title screen, you will be presented with the menu screen. The top part contains a vocabulary of words and letters and the lower half is the text window. Sandwiched between these are the Stickwriter commands which can be identified by their inverse letters.

To create text, position the cursor on the first letter of the word you have chosen, and press the joystick button. The selected word will appear in the text window and the cursor will return to its home position.

Words not in the vocabulary may be spelled by using the alphabet portion of the menu. Stickwriter automatically adds a blank space to the end of each word but not after each letter, so when you spell a word you'll have to add a blank space by pressing the button while the cursor is in the home position.

If the cursor is placed in the middle of the chosen vocabulary word, Stickwriter will print a partial word. This can be used to create words not evident in the vocabulary list. For example, to print "here", place the cursor on the "h" "there".

THE COMMANDS

Choose commands the same way you chose words. Be sure the cursor is on the inverse letter of the command.

PRINT—Every word put in the text window is stored in memory. When you choose PRINT, everything you entered since the last ERASE MEMORY command will be printed to your printer. Printing text will not affect memory.

CLEAR SCREEN—As the text window becomes full, it scrolls up one line. This command will clear the text window, if desired, but will not clear the text in memory.

continued on next page

ERASE MEMORY—This is the only command which will clear text from memory and allow you to start anew. Be careful here: once it's gone, it's gone.

BACKSPACE—This will erase the last character from the text window and memory.

DELETE WORD—The same as BACKSPACE, but deletes the last word entered.

RING BELL—Activates a ten-second warbler-siren to summon help. (Make sure the TV volume is turned up.)

VOICE—This option will work with the "S.A.M. Handler" program printed in **Antic**, February 1985. (Naturally it's also required that you own the S.A.M. speech generator disk. Install "S.A.M. Handler" before loading Stickwriter and be sure to remove the word "REM" from line 840.)

CUSTOM VOCABULARY

You can create your own vocabulary by changing the DATA statements in lines 870 to 940. Just make sure that you have exactly 12 words in each one and that you readjust line 880 as necessary to prevent overlapping words. The numbers in line 880 control the position of the columns in which the words are printed. As presently programmed, the first column of words begins two spaces in from the left border of the screen, the second column begins eight spaces from the left border, etc.

PROGRAM TAKE-APART

For maximum speed, frequently used subroutines are at the start of the program.

70	Turn off the cursor.
80	Turn on the cursor.
90	Disable break key.
170	Disable keyboard.
180	Turn off screen while drawing menu.
190-220	Gets info from data and prints it.
330	Turn screen back on.
370-550	Cursor movement routine.
520-530	Slow down the cursor.
560-670	Read screen input if button pressed.
560	LOCATE command used to read a character from screen; has side effect of erasing character, so. . .
600	Reprints character to screen.
680-840	Input commands processed here.
950-1020	Catch errors and prevent program crash.

Bill Lukeroth is a technical writer from the San Francisco Bay Area whose work has often appeared in ***Antic.***

Listing on page 100 



NEW OWNERS' COLUMN

Get started programming your Atari

by DAVID PLOTKIN

LESSON ONE

New Owners Column is for **Antic** readers who want to learn how to program their brand-new Atari 800XL or 130XE computers—or for those who have owned their Ataris awhile but only used them to run commercial software.

Programming is the ultimate challenge for computer users. As we start these lessons, I won't assume you know anything about your computer except how to hook it up. Before we are done, you should be fairly familiar with programming. I hope you enjoy the trip.

BUILT-IN LANGUAGE

In order to tell your computer to perform specific tasks, you need a **programming language**. You can't simply type English words into your computer and expect it to understand such an illogical vocabulary. Computers are very literal-minded (annoyingly so) and demand extremely precise and consistent communications.

Your Atari computer comes with a built-in programming language called **BASIC** which is quite powerful, comparatively easy to learn and widely used by non-professional programmers. Most **Antic** listings are written in BASIC.

Like a foreign language, BASIC has its own words, called **commands**. These commands tell BASIC what you want it to do. Fortunately, there aren't very many commands to learn—and you can get going without knowing every command. Learning to program in BASIC consists of learning the commands and how to use them, plus becoming familiar with some of the special powerful features of your Atari computer.

LOADING & SAVING

BASIC is automatically turned on when you turn on your computer. The word READY appears on the screen telling you that BASIC is present.

One of the first essentials you must learn is how to move programs between your computer and your storage disks—you don't want to retype the whole program every time you use it. BASIC makes it very easy to perform these operations with the SAVE and LOAD commands.

To SAVE a program you have **entered** (typed into the computer) just type:

SAVE "D:FILENAME" [RETURN]

The square brackets [ ] around the word RETURN are used by **Antic** to show that you should press the key marked RETURN. We'll use the same [ ] symbol to indicate other special keys on the Atari keyboard. Don't type in the brackets.

To LOAD a program you previously SAVEd, just type:
LOAD "D:FILENAME" [RETURN]

Type these (and any other) commands exactly as shown! In this case, you must include the two sets of quotation marks ["] and the colon [:], and type entirely in capital letters. However, in **Antic** the word FILENAME always just stands for whatever name you give your file, so use the name of your choice instead of FILENAME.

An Atari filename can have up to eight letters. If you wish, you can also add a period and a three-letter **extender**— "D:QQQQQQQQ.EEE" could be a filename. The filename can have less than 8 letters, and the extender is *not* required.

TALKING TO COMPUTERS

In order to tell your computer what to do, you will use the keyboard to enter commands. The keyboard of your Atari looks quite a bit like a typewriter, but there are some important differences. Set off from the rest of your keyboard are a series of **function keys** (labeled [HELP], [START], etc.). Many commercial programs use these keys, and I will teach you how to use them in your own programs.

During the programming process, the only function key that actually does anything is marked [RESET]. This key clears your screen if you are programming and will stop a program which is running. The [RETURN] key

at the right of your keyboard is used for telling the computer you have finished entering a comand or a line of commands.

For example, to make a BASIC program which you have LOADed from the disk start to RUN, you would type RUN and press the [RETURN] key. When entering (typing in) a BASIC program, such as the one included with this column, you would press the [RETURN] key at the end of every line. A program line is a series of instructions that begins with a line number.

Another key you won't find on the typewriter is the [BREAK] key in the upper right corner. This key will normally stop a running program. It will also move the white square on the screen (called a **cursor**) down the screen without entering the command or line the cursor is on—pressing the [RETURN] key *would* enter the command or line.

The [INVERSE VIDEO] key is in the lower right corner of your keyboard, marked with a small two-color square [◪]. It prints characters on your screen in **inverse** (dark characters against a light background).

EDITING ON SCREEN

Whatever you type on your keyboard while you are programming will show up on the screen. The next letter you type will show up where the white cursor block is located. Some special keys on your keyboard allow you to move the cursor around the screen, so that you may type anywhere. This is especially helpful when you are editing a program you have written, and need to get to a particular place on the screen to change something.

Four keys to the right of the keyboard are marked with arrows. The cursor will move in the direction indicated by these arrows when you hold down the [CONTROL] key and *at the same time* press an [ARROW] key. Three additional editing keys are in the upper right corner of your keyboard, alongside the [BREAK] key.

The [CLEAR] key will blank the screen if you press it while the [CONTROL] or [SHIFT] keys are held down. This does *not* erase your program, it only clears the screen. The [INSERT] key will insert a space if used with the [CONTROL] key, and will insert a line when used with the [SHIFT] key.

Finally, the [DELETE BACK SPACE] key will move the cursor one space to the left, erasing whatever was in that space. But when you use this key while holding down [CONTROL], it deletes whatever is under the cursor—and everything on the right moves one space leftward. To delete the whole line the cursor is on, hold down the [SHIFT] key while pressing the [DELETE] key.

ERROR MESSAGES

Whenever possible, your Atari tries to help you learn to program by pointing out when you make errors. These error messages are essentially of two types. The first type of message occurs when you are entering a program and make a mistake so the computer doesn't understand what you want. This is called a **syntax error** because it indicates that some is wrong in the syntax (grammar) of your program line.

For example, suppose you typed PRONT instead of PRINT. After you press [RETURN], the computer will reprint the line with the word ERROR. And it highlights the point at which it couldn't understand your commands. You may either retype the entire line carefully, or use the editing keys described above to delete the word ERROR, correct the mistake, and then press [RETURN] again.

The second type of error occurs when you are actually running a program. Naturally enough, it is called a **programming error**. The program will stop and display a numbered error message on the screen. You will then have to go to your manual to figure out what the message means and what went wrong. This is often difficult and is known as "debugging".

For our purposes right now, if the program stops and gives you a numbered error message, the thing to do is check and make sure that the program was typed in *exactly* as printed. To start this check, type LIST and press [RETURN]. To pause the listing as it **scrolls** (goes by) on the screen, press [CONTROL] and the [1] key at the same time. Press them again to resume the scrolling movement.

HELLO PROGRAM

Included in this issue's Software Library pages is "My Hello Program." Type it in *carefully* and SAVE it to disk before you RUN it. At the end of each of the numbered lines press [RETURN], to enter that line's information into the computer memory. Take care of any errors as outlined above. For now, don't try to use the TYPO II automatic program-checker. When you are finished typing it in, SAVE it to disk by typing "D:MYHELLO.BAS" and then pressing the [RETURN] key. This process ensures that if your computer's memory is erased by an accidental power outage, you can simply turn the Atari back on and LOAD your program back into memory from disk, as described above.

Now, type RUN and again press [RETURN]. You may not understand the way this program works yet, but before long you will.

(New Atari owners will find additional details about topics covered by this series in Lon Poole's excellent book, ***Your Atari Computer*** *($17.95), Osborne/McGraw-Hill Publishing, Berkeley, CA.*—ANTIC ED)

David Plotkin is a chemical engineer and a longtime ***Antic*** *author/programmer.*

Listing on page 91

BITZ

Computer aided bit shifting help

by DON LEBOW

For you beginning assembly language programmers, we present Bitz. This BASIC program graphically illustrates bit manipulation. Bitz runs on all Atari 8-bit computers, with disk or cassette — and we've thrown in the source code for the USR routines.

We all have our little roadblocks. I was learning machine language, and everything seemed to be going pretty well—until I got to that bit-shift stuff. The text explanations *seemed* clear enough, but throw a quick EOR at me in a source listing and my brain fogged out. I just didn't think in binary!

After too many hours spent flipping through conversion tables, I decided that it was time for my computer to help me out. That's what they're for, right?

Bitz is the result. This is a short program that shows the bit settings in nice big Graphics 1 print. For convenience, all the numbers are there: decimal, hexadecimal and binary. And you can do any one of the four shift commands (ASL, LSR, ROL, ROR) as well as the mask commands (AND, ORA, EOR, BIT). USR routines do all the conversions by—what else—shifting bits.

THE PROGRAM

Type in Listing 1, BITZ.BAS, check it with TYPO II, and SAVE a copy before you RUN it. Listing 2, BITZ.M65, is the assembly source code for the USR routines. It's there strictly for information and need not be typed in. NOTE: Don't leave the REM statements out of Listing 1. I like to use a modular approach to BASIC programming, and many of the REMS are targeted by GOTOs and GOSUBs. There are programmers who hate targeted REMS, but I find my programs easier to modify when written in this fashion.

When you run Bitz, you will be prompted for a single or double byte operation. Press [1] to try out single byte bit shifts, such as ASL, LSR, ROL, and ROR. If you wish to try masking operations on two bytes, press [2], in which case you can experiment with AND, OR, EOR, and BIT operations.

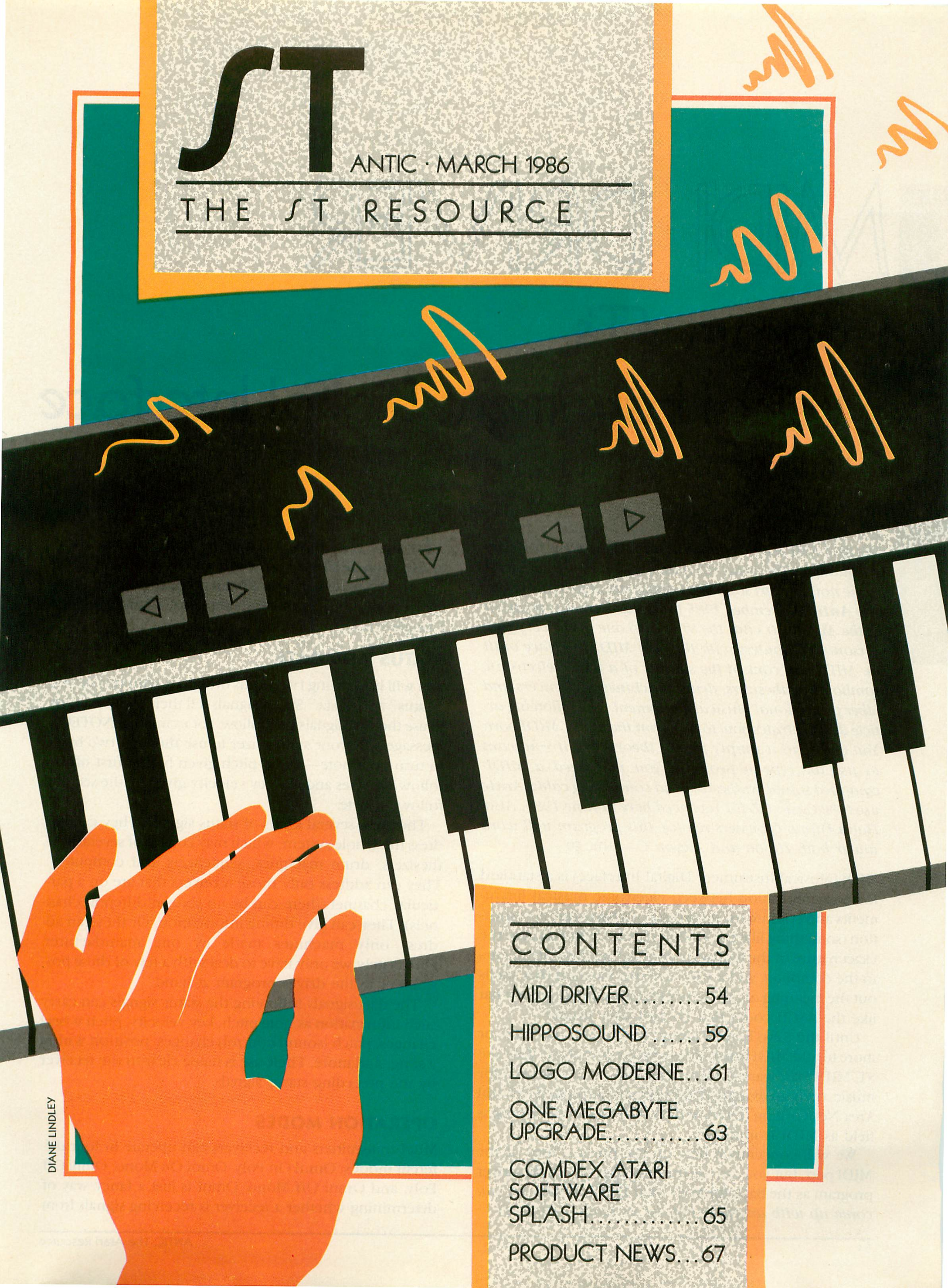
When prompted for a target, input (in decimal) the number you wish the operation performed upon. Notice that you may retain or clear the carry on single byte operations. With the double byte AND, OR, and EOR, you will first be prompted for the target number, and then the mask. BIT operations will first request a mask.

Although input is in decimal, output will display decimal, hexadecimal and binary as well. Also, at the bottom of the screen you will see the results of your operation on the carry flag, the zero flag, and the sign flag.

Spend enough time with Bitz and you'll soon be able to think in binary. Who knows? After awhile you might even start thinking in byte-array.

Don Lebow is from Lahaina, Hawa… where he seems to find just eno… time from the warm surf and f… ly breezes to write utilities … Bitz.

Listing on …


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DIANE LINDLEY

MIDI DRIVER

Program ST's Musical Instrument Digital Interface

by TOM JEFFRIES

*The AY-3-8910 sound chip built into the 520ST is perfectly adequate for the usual computer sound requirements—game noises, alert sounds in application programs, etc. (See **Antic**, November 1985 for a detailed examination of the AY-3-8910.) But the ST is also one of the very first personal computers with the new MIDI interface built in. MIDI can control the sounds of a whole electronic combo of synthesizers, drum machines, sequencers and other professional musical equipment. The following article demonstrates how to program the 520ST MIDI port. You can read it simply for the theory, but if you want to use the type-in program you will need a MIDI-equipped sound synthesizer and connecting cable. **Antic** used the Casio CZ-101 reviewed here in June 1985. Also, Haba Hippo-C owners rejoice, this program will work under both Hippo and Alcyon C.*—ANTIC ED

MIDI (Musical Instrument Digital Interface) is a standard for communication between electronic musical instruments and computers. It consists of a hardware specification (something like the RS-232 standard) that dictates the exact nature of the hardware connecting the instruments to the computer, and a software specification that spells out the meaning of the signals that are passed, somewhat like the ASCII codes that control your printer.

Until the 520ST came along, you had to pay $100 or more to add MIDI capabilities to your computer. With the ST, MIDI hardware is already built-in. It can be used for music, or as an extremely inexpensive approach to Local Area Networking (LAN), which is as hot in the business field as MIDI is in music.

We will concentrate here on the musical uses of the MIDI port, but you can use the information and the driver program as the basis for your own LAN program. *(If you come up with anything hot, let us know.*—ANTIC ED.)

Listing 1 is a simple MIDI driver that will enable you to use your ST to play a melody on virtually any MIDI-equipped synthesizer. Your ST can produce multiple-voice (polyphonic) music. But for simplicity, I have provided a single-voice (monophonic) driver.

STATUS AND DATA

You will be sending two kinds of signals with this driver: "status" and "data." Status signals tell their recipient how to use the data signals that follow. For example, a NOTEON message tells your synthesizer to use the next two bytes to turn on a note—at the pitch given by the first of the following bytes and the key velocity given by the second following byte.

There are several kinds of status signals. They can address the whole system, which may consist of several synthesizers, drum machines, sequencers and computers. They can address only those receivers that are on a particular channel (there can be up sixteen different channels). They can give timing information. Or they can address only machines made by one manufacturer. Fortunately we only have to deal with a few of these possibilities in the driver program at hand.

The data signals following the status signals can carry such information as note pitch, key velocity, pitch wheel changes, patch (sound control) changes, position within a song, and more. Their use is made clear to the receiver by the preceding status signals.

OPERATION MODES

MIDI transmitters and receivers can operate in four different modes: Omni On Poly, Omni On Mono, Omni Off Poly, and Omni Off Mono. Omni is just a fancy way of determining whether a receiver is receiving signals from

all sixteen channels (Omni On) or from a limited number of channels, usually one.

Omni On/Off is a very powerful feature of MIDI. In Omni Off mode you could have sixteen sets of Midi-equipped instruments, each on a different channel, playing different things at the same time. In practice this is difficult to achieve, since the slight time delays inherent in MIDI's 31,250 baud transmission rate add up to an audible lag when many instruments are daisy-chained together. But special splitter boxes eliminate of much of the time problem, and some very complex systems exist.

Most polyphonic synthesizers power up in Mode 1, Omni On Poly. So one of the first things the driver program has to do is switch to Mode 2, Omni On Mono.

THE PROGRAM

We're now going to describe how to type in and compile the program in both Haba Hippo C and Alcyon C. You'll notice there are two listings. Listing 1 is the MIDI program. Listing 2 is assembly language source code that will create a link file so that Hippo-C owners can use **Midiws()**, which is an ST XBIOS function. Alcyon owners do not need to type this in.

Antic Disk subscribers will find the object code on their disk as MIDI.PRG. If there is enough disk space, the source code will be included as well. With the proper equipment, you can port the programs from an Atari 8-bit computer to your 520ST. See the January 1986 **Antic** for instructions.

HIPPO TYPE-IN

Alcyon people can skip to the next section. Hippo owners, type in both Listing 1 and 2. In Listing 1, be sure to put the **char midistring[ ]** on a line of its own. Also, watch for the remarks. Don't type in the **include#** files that are meant for the Alcyon C people.

Save Listing 1 under the filename MIDI.C. Save Listing 2 under the filename SMIDI.S. Both files should be saved within the USR folder.

From the A: prompt, type **c midi** [RETURN] to compile Listing 1. With luck, this should create a file called MIDI.O.

Again, from the A: prompt, type **ASM SMIDI.S** [RETURN]. Hippo-C will quickly assemble the source code into a file called SMIDI.O which can be linked with any C program you write to provide the XBIOS MIDI call.

Now, let's put the whole thing together. Type **ld -S midi.o smidi.o** [RETURN]. When the A: prompt appears, type **logout** to get to the desktop, rename the A.PRG file, if you wish, then skip down to the section called HOOKING IT UP.

ALCYON TYPE-IN

As we said, Alcyon C owners can ignore Listing 2. Type in Listing 1 and save it as MIDI.C. Include the **include#** files, but don't type in the **extern Midiws();**. As with last month's instructions, we will assume a single drive system. You may reconfigure the following files for your own system.

You will need a compiler disk and a linker disk. The compiler disk must contain the following files: AS68.PRG, AS68INIT, AS68SYMB.DAT, C068.PRG, C168.PRG, CP68.PRG, OSBIND.H, STDIO.H, BATCH.TTP, RM.PRG, WAIT.PRG, C.BAT. The last file, C.BAT, is user defined below.

The C.BAT file contains:

```
CP68 %1.c %1.i
C068 %1.i %1.1 %1.2 %1.3 -f
RM %1.1
C168 %1.1 %1.2 %1.s
RM %1.1
RM %1.2
AS68 -l -u %1.s
RM %1.s
WAIT
```

On your linker disk, you will need: GEMS, GEMLIB, OSBIND.O, BATCH.TTP, RM.PRG, WAIT.PRG, LINK.BAT.

LINK.BAT contains:

```
LINK68 [u,s] %1.68K=gems,%1,gemlib,osbind,libf
RM %1.o
RELMOD %1.68K %1.prg
RM %1.68k
WAIT
```

Insert your compiler disk with the C source code on it. From the Desktop, double-click on BATCH.TTP. In the parameter box that appears, enter a **c**, one space, and your source code filename *without the ".c" extender*. Cross your fingers and double click on OK. You should end up with a file called MIDI.O. Transfer this file to your linker disk.

With the linker disk in the drive, double-click on BATCH.TTP. In the parameter box, type in LINK MIDI, again *without the ".o" extender*. You should now have an executable file called MIDI.PRG.

HOOKING IT UP

Once the program is compiled and linked you are set to go. Plug a MIDI cable into the MIDI OUT port of your ST and the MIDI IN port of your synthesizer, set the synthesizer to channel 1, and run the program. It should play a short musical phrase in whichever patch you've chosen. I tested this program on an Oberheim OB-8 but it should work on any synthesizer with MIDI capabilities.

PROGRAM ANALYSIS

Now look at Listing 1. There are a series of **#define** statements that tell the compiler what some of the MIDI terms mean. Two of these, **TEMPO** and **NUMBER_NOTES**, may be adjusted to fit your own music.

TEMPO sets the length of a timing loop that determines how quickly the music moves. **NUMBER_NOTES** limits the length of your piece. If it is too high, you waste memory (not a major problem on the ST). If it is too low the program will not read all of your notes.

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The actual program, beginning at **main()**, is divided into two parts. The first part takes the string you write, **musicstring**, and converts it into MIDI key codes—**midistring**—and the lengths for notes and rests—**notelength** and **restlength**. *Figure 1* shows the relationship between the musical notes and the MIDI key codes.

YOU CALL THE TUNES

I put a sample musical phrase in the program so you can run it as is the first time through.

To put your own melody into **musicstring**, first enter the note name (which must be lower case or the program will reject it). If you want a sharped note, follow the note name with a "#." Note names and '#' characters must be enclosed in single quotation marks. This program does not understand flats, so you will have to express all chromatics with sharps.

Follow the note instruction with the octave in which you want the note to sound (See *Figure 1*), followed in turn by the length you want the note to sound, and then the length of the rest after the note, if any. If you want legato (connected) notes, use zero for the rest length. *Figure 2* gives a sample set of length values.

Repeat this process until you have entered all of the notes you want. Then write an "x" after the last rest length, in the place where the next note name would be.

When the program runs, it checks for letters or numbers it doesn't understand. If there are any errors, a message is printed and no MIDI data is sent to your synthesizer.

I cheated a bit when it came to printing on the screen. The proper way to deal with such things in GEM is to open a window and use the GEM function calls. To save

continued on next page

Figure 1

note	octave	MIDI#	note	octave	MIDI#	note	octave	MIDI#	note	octave	MIDIx
c	0	0	c	3	36	c	6	72	c	9	108
c#	0	1	c#	3	37	c#	6	73	c#	9	109
d	0	2	d	3	38	d	6	74	d	9	110
d#	0	3	d#	3	39	d#	6	75	d#	9	111
e	0	4	e	3	40	e	6	76	e	9	112
f	0	5	f	3	41	f	6	77	f	9	113
f#	0	6	f#	3	42	f#	6	78	f#	9	114
g	0	7	g	3	43	g	6	79	g	9	115
g#	0	8	g#	3	44	g#	6	80	g#	9	116
a	0	9	a	3	45	a	6	81	a	9	117
a#	0	10	a#	3	46	a#	6	82	a#	9	118
b	0	11	b	3	47	b	6	83	b	9	119
c	1	12	c	4	48	c	7	84	c	10	120
c#	1	13	c#	4	49	c#	7	85	c#	10	121
d	1	14	d	4	50	d	7	86	d	10	122
d#	1	15	d#	4	51	d#	7	87	d#	10	123
e	1	16	e	4	52	e	7	88	e	10	124
f	1	17	f	4	53	f	7	89	f	10	125
f#	1	18	f#	4	54	f#	7	90	f#	10	126
g	1	19	g	4	55	g	7	91	g	10	127
g#	1	20	g#	4	56	g#	7	92	Highest allowable		
a	1	21	a	4	57	a	7	93	MIDI note number.		
a#	1	22	a#	4	58	a#	7	94			
b	1	23	b	4	59	b	7	95			
c	2	24	*c	5	60	c	8	96			
c#	2	25	c#	5	61	c#	8	97			
d	2	26	d	5	62	d	8	98			
d#	2	27	d#	5	63	d#	8	99			
e	2	28	e	5	64	e	8	100			
f	2	29	f	5	65	f	8	101			
f#	2	30	f#	5	66	f#	8	102			
g	2	31	g	5	67	g	8	103			
g#	2	32	g#	5	68	g#	8	104			
a	2	33	a	5	69	a	8	105			
a#	2	34	a#	5	70	a#	8	106			
b	2	35	b	5	71	b	8	107			

*"middle" c on the piano

program space, since so little printing to the screen is required, I used a standard C function, **printf()**.

Thus, you will see your note names and any error messages printed up at the top of the screen. Those of you who have been following **Antic's** previous ST articles on the ST should have no trouble adding a proper window and some fancy visual effects to go along with the music.

FURTHER ANALYSIS

The second part of the program is the real meat of the driver, so we will go over it a section at a time.

After checking to see if there were any errors—**if (!merror)** means "if the **merror** flag has not been set"—the second part of the program starts sending MIDI data. **midistring** was initialized to **Mode 2** near the beginning of the program.

To send a string of data to the MIDI handler, called **Midiws()**, put the number of items to be sent, minus one, and the name of the array that holds them in parentheses after the word **Midiws()**. The compiler inserts the proper instruction to call the **Midiws()** function, and, at run time, the **Midiws()** code pulls the information from the stack and goes to work. It's impressively simple and easy to use.

To send the note data, the first byte of the midistring is set to the **NOTEON** signal, which occupies the upper four bits of the first byte of the next string. The lower four bits must give the channel number. And since you will set your synthesizer to receive on channel 1, the program adds the proper value for channel 1.

That sets things up for the main program loop. Each time the program passes through the loop, a counter is incremented. The counter is used to reference the correct place in each of the arrays.

The first line within the loop causes he MIDI note number to be printed to the screen which gives you a visual check on the operation of the program.

Each **NOTEON** in MIDI must be followed by a note number—given by **notestring[i]**—and then a key velocity (**FULLVELOCITY**) in case your system has a touch-sensitive keyboard.

Since only three numbers must be read by **Midiws()** this time the number in the parentheses is changed to a 2 (number of bytes minus one).

Nested FOR loops give a time delay determined by **notelength** and **TEMPO**.

There are at least two ways to shut the note off. The **NOTEOFF** command works, but by sending a **NOVELOCITY** command it is possible to take advantage of one of MIDI's features and cut down the number of bytes that have to be sent.

Think of it this way: a key pressed with no velocity won't produce a sound. Once a **NOTEON** is sent, you can play a string of notes of any length by simply sending a series of note number and **FULLVELOCITY** when you want a note to sound and **NOVELOCITY** when you want the note to end. This is called "Running Status", and will stay in effect until a status byte is sent.

This program does not take advantage of the reduction in the number of signals sent that Running Status offers. In order to keep the program as clear as possible, the **midistring** array keeps **NOTEON** as its first member and maintains a length of three bytes. A more sophsticated program could save one byte each time around except the first time by eliminating the **NOTEON**.

Another set of nested FOR loops gives the rest length. Note that a rest value of zero results in an immediate exit from the loop.

Technically every **NOTEON** eventually has to have a corresponding **NOTEOFF**, so when the main loop is finished this chore is taken care of.

Ths program is only a small sample of what MIDI can do. For more information, contact the manufacturer of your synthesizer.

There is also an International MIDI Association at 11857 Hartsook Street, North Hollywood, CA 91607. (818) 505-896. They publish an informative newsletter and you can get a copy of the complete MIDI specification from them. Or if you want something a little easier to understand, they are publishing a book on MIDI that includes the MIDI spec with an explanatory section. The price is $35.

Tom Jeffries of Oakland, CA is a professional musician and programmer. He is currently writing or translating soundtracks for computer games and writing music-related software.

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Figure 2

Whole note	192
Dotted half note	144
Half note	96
Quarter note	48
Dotted quarter note	36
Eighth note	24
Sixteenth note	12
Eighth note triplet	16
Sixteenth note triplet	8
Quintuplet	10

HIPPOSOUND

New XBIOS for Haba Hippo-C

by PATRICK BASS, **Antic** ST Program Editor

*Antic has begun receiving letters from readers who want to know why they can't get our C program listings to work on their **Haba Hippo-C**. Most of the reasons were addressed in our review of the product last month. There are two main problems: No floating point package and no XBIOS link file. We can't do much about the first, but we can offer some XBIOS linkage code. The following article provides Hippo-C owners with two XBIOS calls which they can assemble and link with their C programs. **Antic** has also uploaded a custom-designed Hippo-C XBIOS link file in the Utilities Library of SIG/Atari 16-Bit Forum on CompuServe. Instructions for using this link file will be found in the ST Section of ANTIC ONLINE.*

Because of further incompatability problems, however, you still won't be able to type in and run our previous listings—which were written in developers' Alcyon C—under Hippo-C. But we're providing a program here that will demonstrate how to use the new XBIOS calls in this article. We might add that the XBIOS source listing here will not work with Alcyon C because, among other things, Hippo-C passes all parameter data as longwords. Hopefully, Haba will soon provide an update to their C which includes floating point, and a bit more compatibility with Alcyon C. — ANTIC ED

WHAT'S XBIOS?

In the realm of CP/M 68K the acronymn "BIOS" stands for "Basic Input/Output System." And in the Atari 520ST the term "XBIOS" is a shorthand way of saying "eXtended BIOS". Extended BIOS routines are designed to handle machine-specific tasks for the Atari 520ST—such as changing the screen location, setting the color palette, or accessing the MIDI port.

There are around 30 of these routines which can be found on a binary link file in the Developers' Toolkit, available from the Atari Corp. for $300. This toolkit, which was developed by Digital Research, Inc., also includes Alcyon C.

But with a little information and some 68000 machine language savvy, you can write your own. Listing 1 is machine language source code for the two XBIOS calls, **Random( )** and **Giaccess( )**. The first routine returns a random number, and the second accesses the AY-3-8910 sound chip.

THE DEMO

The XBIOS bindings here are written in 68000 assembly language as implemented by Hippo-C. If you own Hippo-C, then you already have the 68000 assembler that will construct this file.

Examine Listing 1. This is 68000 assembly source code, and may be typed in using the Hippo-C text editor. Type it in exactly as shown and save it to disk under the name: XBIOS.S.

Now back at the "A:" prompt, type: **asm xbios.s** [RETURN]. Hippo-C will quickly assemble this source code to a file called XBIOS.O inside your USR folder. This is your XBIOS link file. You may now use this on any future Hippo-C programs that need **Random( )** and **Giaccess( )**, such as Listing 2.

Listing 2 demonstrates the use of both XBIOS routines by simply opening a virtual workstation, sounding 100 random pitched notes, and then exiting back to the desktop. (For a detailed map of the registers inside the AY-3-8910 sound chip, see the November, 1985 **Antic**.)

Type in Listing 2 exactly as shown using the Hippo-C editor and save it to disk under the name HSOUND.C. Leave the editor, and from the "A:" prompt type **c hsound** [RETURN] *without the ".c" extender.* Hippo-C will compile, and then assemble, your C source code into a file called HSOUND.O within your USR folder.

LINK TOGETHER

To properly connect, or "link," your XBIOS file to Listing 2, from the "A:" prompt type: **ld -S hsound.o xbios.o** [RETURN]. (Be sure to use a capital S.) When the "A:" prompt reappears, you should find your finished program, **A.OUT**, which may be renamed and run from the Desktop.

continued on next page

LISTING 1 TAKE-APART

Before rushing into a run of the program, let's take a closer look at our two listings, beginning with Listing 1.

At the top is a short block of remarks. The first non-remark line is **.text**, which directs the assembler to assemble the following code into the text segment instead of the initialized and non-initialized data blocks.

In the "Global Communications Section," we establish common labels which will be called from outside this program. Since we need a way to tell other programs at link time that we have two routines available for use, we use the assembler directive **.global**, which treats the labels **_Random** and **_Giaccess** as being available globally—or from outside as well as inside this section of code.

BUILDING RANDOM

The following subroutine teaches the 520ST how to return a random 24-bit number. The subroutine which actually figures the random number is already in place within TOS, and is known as TRAP #14, opcode #17.

TRAPs in the 68000 are like the CIO routine in the 8-bit Atari computers. You load an opcode (command) number and jump through a common vector to perform different tasks. Except the 68000 has 16 different TRAP vectors with TRAP #14 being the trapdoor into Atari XBIOS.

The first line is the subroutine label, **_Random:**. (The colon is a programming convention to indicate this is a label.)

Next is the **link** statement which safely stores the current value of address register #6 (a6), then lets us use a6 as our own special stack pointer. Our temporary stack has a reserved length of two bytes. (Note: There's no similarity between this opcode "link" and the "link" in linkfiles.)

The next line down will **move** a **.w**ord (two bytes) "immediately" (**#**) the value **17** decimal (the XBIOS opcode number for Random), to wherever our stack pointer **(sp)** points. Remember, we reserved those two stack bytes in our previous line.

Next, jump through **trap #14** into Atari XBIOS. When finished, we return to the next program line and our random number can be found in data register zero (d0).

unlk a6 will erase the use of our local stack and restore the previously saved value for address register six (a6). Since we're finished, we **rts** (Return from Subroutine) back to the calling program.

GIACCESS

Now, for our second XBIOS routine, **_Giaccess**. Again, we use address register six (a6) as our local stack, this time with 12 bytes reserved on it.

The first of the next three **move** statements moves the passed register number onto the top of the stack. The second **move** places the passed data value onto the next available location on the stack. And the last will push the Giaccess opcode number (28) onto the next available location on the stack.

We now call TRAP #14. Atari XBIOS will read/write the AY-3-8910 chip as we desire and then return to **unlk a6**, after which we **rts**—return to the caller.

DEMO TAKE-APART

Looking at Listing 2, which is written in C, we first see a group of comments bracketed by /* and */. Following this, we declare our variables, initialize our constants, and dimension our arrays.

Right below that, in the "External Communications" section, we tell C to be on the lookout during link time for previously defined labels called **_Random** and **_Giaccess**. The linker will supply our program with the values associated with these labels—the final addresses of **Random( )** and **Giaccess( )**.

Now we get to **main( )**, the body of the program. The top four lines initialize the GEM application as we've seen in previous **Antic** listings.

The next three lines demonstrate how to write to and read from the AY-3-8910 chip. (For complete details of this chip, see ST Sound in **Antic**, November 1985.)

The **Giaccess( )** call takes the form: **value = Giaccess (data, register)**, where the **value** of the **register** is returned if nothing is added to the desired register number, and **data** is written to **register** if the desired register number has 128 added to it.

The first **Giaccess( )** call writes the volume for channel A. The second call saves a copy of register #7 before modifying it. This register controls not only which voices make noise, but also the data direction of two parallel ports the ST uses to control the disk drives. We save this value in **port_state** so we can later control our drives. The last line in the trio enables voice A to make a pure tone.

Now, we create a For loop that will plug 100 random numbers into the note register of voice A. Inside the loop, two random numbers are placed in **x_note** and **y_note**, which represent the 12 bits of voice A's range. Net result?—a random beep or boop. The last line in the loop is a nested delay loop which waits a short while so we can hear the note just selected.

The **Random( )** call does not take parameters. It will return a 24-bit random number. Because the pitch register is a split register consisting of a 8-bit low and 4-bit high, we are masking our two random numbers accordingly.

After 100 loops, we drop to the next **Giaccess( )** call that shuts the playing volume off, restores the **port_enable** register—remember, it controls two parallel ports—then closes our workstation and performs an application exit to the desktop.

WRAP-UP

Still with me? Here we have shown how to build small extensions to Hippo-C that should be helpful in two of the most basic computer game areas, sound generation and random numbers. The idea here is to show how to write a "helper" subroutine in 68000 machine language and call it from Hippo-C.

P.S.—If you wish, you may add the **Midiws( )** XBIOS source code from this issue's MIDI article to this listing so that your resultant link file contains all three XBIOS calls.

Listing on page 97

ST LOGO MODERNE

Bright, colorful, random geometric displays

by BUD COOL

Since Logo is the only language included with early 520STs, many owners have been struggling with a new vocabulary. Dyed-in-the-wool BASIC programmers might find Logo a little strange but, like anything else, once you understand how it works, you can do a lot with it.

Logo is a *procedural* language. This means programs are broken up into small, individually defined tasks—or procedures. This will make your programs easier to read and debug. Each procedure can call another procedure. In what is known as *recursive* programming, procedures can even call themselves.

Logo Moderne is a set of Logo procedures that will create an electronic work of art on your ST's low-resolution color screen. It draws several sets of geometric figures, randomly picking the various attributes, such as screen position, size, line width, color, and fill pattern.

EASEL SET-UP

Although Listing 1 is designed for low resolution, you may wish to use medium resolution while you are actually typing it in. Whichever you choose, save a copy of the program and get your ST into low resolution before loading the listing into memory.

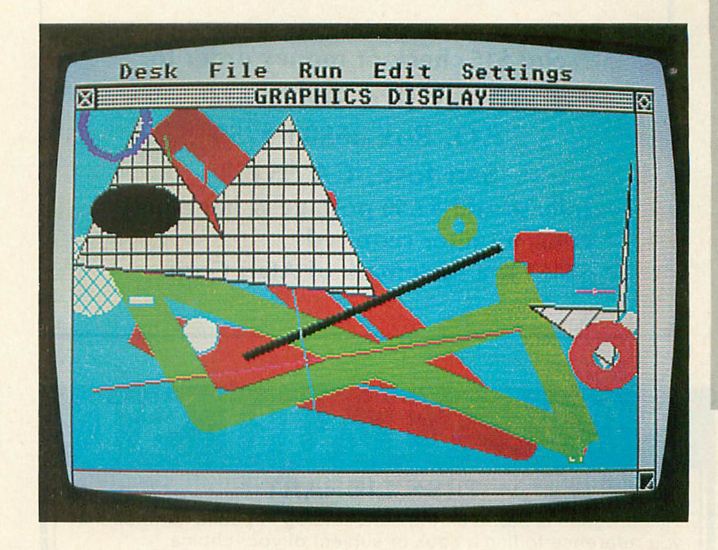
Before going any further, you might want to click on the Buffr Grph option on the Setting Menu. This will save your artwork in a buffer so that it can be re-displayed should a Dialog or Menu Box appear over it.

When the program is in memory, type **MODERNE** from the Dialog Window and press [RETURN]. Click the upper-right box of the Graphics Display Window to get the full effect.

When the drawing is finished, the Dialog Window will reappear. You can get rid of the pesky critter by clicking anywhere within the Display Window.

To create a new picture, pull down the Run Menu and click on Run Buffer. Voila! Another original!

You might want to experiment with Logo Moderne. Try



changing the CANVAS procedure to limit the number of colors. If you don't care for your palette, call up the Control Panel and change it—for example, try several different shades of blue.

If you would like to have more—or less—objects drawn, change the REPEAT 5 [OBJECTS] value in the MODERNE procedure. Or, take out the REPEAT statement altogether, call OBJECTS, then assign a REPEAT value to each individual procedure within OBJECTS. This way you can vary the quantity of each particular object that is drawn.

You can change the sequence in which objects are drawn. To avoid certain objects being overlaid, put them at the end of the procedure.

Play around with different RANDOM statements. Some of them, like Index, Style and Color values for SETFILL can't get any larger. But most can be altered in some way.

Enjoy your Atari masterpieces—each one a guaranteed original. Who knows, maybe STs will start appearing in galleries across the country, exhibiting this latest form of electronic art.

*Bud Cool is from Hazelwood, Missouri and Logo Moderne is his first program published in **Antic**.*

Listing on page 98 

ONE-MEGABYTE ST UPGRADE

1 million bytes of RAM—only $175

by JACK POWELL, **Antic** Associate Editor

One million bytes of memory. It's nice to have elbow room. Seems as if the 520ST was no sooner on dealer's shelves than the first schematics appeared, describing how to double your RAM.

And what could you do with all that elbow room? For one thing, **DB Master**, a new database coming soon from Atari, is RAM-based. With a 1-meg upgrade, you could increase DB Master's available record count to an amazing 4,000.

At **Antic**, we were getting a little tired of waiting over 10 minutes each time we compiled a C listing. With a RAMdisk—and enough memory—we could put all our compiling and linking files into the RAMdisk and compile to (and from) RAM.

We had seen several do-it-yourself 1-meg upgrade articles in users newsletters and on bulletin boards. From their descriptions, it seemed pretty easy.

So we contacted Computer Support, the authorized Northern California Atari repair center that fixes **Antic**'s overworked equipment. They told us they had already spent some time on the 1-meg project and discovered that the process was not as easy as advertised.

Among other things, they found you had to use the correct wire gauge or you lost information during massive file transfers. They also discovered that the memory controller chip in earlier STs couldn't handle one megabyte of memory and had to be replaced. They told us horror stories of burnt-out chips resulting from improper 1-meg upgrades.

But they had been in continual contact with Atari engineers and just finished a refinement of the upgrade procedure which they confidently believed could be offered to their customers. Did we want to test it? Sure.

Our machine returned from Computer Support looking just the same as when it had left. Except when we booted it with a RAMdisk installed, the RAMdisk showed 684K!

We quickly moved all our compiling, assembling and linking files onto the RAMdisk. There was plenty of room. Next we moved some source code that had previously taken over 10 minutes to compile. How long did it take with our RAMdisk? Less than one minute.

You want one, right? We don't blame you. However, we recommend that you get the job done by professionals at an authorized Atari service center. Computer Support, for example, charges $175 for a 1-meg upgrade, including parts.

ST RAMDISKS

A RAMdisk is nothing more than an area of memory set aside as a buffer that responds to most of the available disk commands—only *much* faster. You get the illusion there is a very fast, extra drive in your system. Of course, since it's all in RAM, you will lose all data on the RAMdisk everytime you

continued on next page



turn off the power switch. Thus, it's a good idea to save your files to a real disk fairly often.

You can use RAMdisks without a 1-meg upgrade, but with the 520ST's GEM in RAM and only 250K spare memory, there's not really enough space for practical use. The maximum size RAMdisk in such a configuration would be about 190K with some 50K left for your program. For a practical RAMdisk, you need more memory.

There are already several RAMdisks available for the ST. Except for minor details, they all offer the same thing. There is one curious difference—each RAMdisk provides a different amount of maximum available RAM, although all their programs are about the same size.

Hippo RAMdisk, from Hippopotamus Software, is perhaps the easiest to set up because it uses the GEM environment. It also offers the most available RAM—684K with a 1-meg upgrade, using the 198K TOS.

Click on the program, choose your RAMdisk size from the drop-down menus, place your boot disk in the proper drive, and install the RAMdisk. Now, when you boot the disk, it will have an "H" disk labeled "HIPPORAMDISK." As with most of the RAMdisks available, you can create more than one RAMdisk on the same boot disk.

A-RAM, from the Antic Software Catalog, is a British import which offers the next greatest amount of available RAM—678K, using the same configuration as above. The only real difference is that you type in your RAMdisk size rather than clicking on it with a mouse. A-RAM will install the first RAMdisk as "D."

M-Disk, from Michtron, offers the least amount of available RAM: 597K. We have no idea where the missing kilobytes went. M-Disk installs as drive "C."

There is also a public domain RAMdisk we found on CompuServe. Written by Gert Slavenburg, this RAMdisk has one big advantage over the rest. It's free.

But, of course, there's no free lunch. The public domain RAMdisk copies all files from the boot disk to the RAMdisk, including the huge TOS.IMG. This not only creates 50% to 60% more boot-up time, but you then have to remove all those unwanted files. The program also yields a paltry 346K RAMdisk—about the size of a normal, single-side drive.

SOURCES

1-MEGABYTE UPGRADE
Computer Support
52 South Linden Avenue, #1
South San Francisco, CA 94080
(415) 589-9800
$175
(Also check with your authorized local Atari repair center.)

HIPPO RAMDISK
Hippopotamus Software
985 University Avenue, Suite 12
Los Gatos, CA 95030
(408) 395-3190
$34.95

A-RAM
Antic Software Catalog
ST215
$19.95

M-DISK
Michtron
576 S. Telegraph
Pontiac, MI 48053
(313) 334-5700
$39.95

COMDEX ATARI SOFTWARE SPLASH

40 ST developers show their stuff

By JACK POWELL, **Antic** Associate Editor

Determined to put an end to press reports about lack of software for the 520ST, Jack Tramiel's new Atari Corp. gathered over 40 third-party developers at its November COMDEX exhibit in Las Vegas and put on a splashy show.

The plum-colored Atari booths were centrally located in the West Hall of the Convention Center. Any visitor to the vast building could not help noticing the increased density of the crowds within the Atari exhibit, which covered three separate islands.

As most **Antic** readers are now aware, the Atari organization is run by a man who savors a good fight. This was underscored when onlookers, drawn to the graphic display of several "Amiga" bouncing balls, found themselves standing in the center of the densely-packed Atari exhibit. Flaunting the competition, the Tramiel group had lined up three computers—Commodore Amiga, Atari 520ST, and Apple Macintosh—each labelled with its price tag and running the bouncing ball program. The ST ball ran moved slightly faster than the Amiga. The Macintosh ball was pitiably slow—and colorless. The price was right on only one machine. You guessed it.

And over in the corner was our old friend the 8-bit Atari—also displaying an animated Amiga bouncing ball! It seems Amiga may have chosen the wrong demo with which to identify their computer.

CD ROM CANCELED?

Antic spoke with Jack Tramiel in an attempt to get answers to many of the questions our readers have been asking. We had noticed a lack of new hardware at the Atari booths. Where was the CD ROM?

Tramiel told us he had been unable to find a basic drive mechanism at a low enough price. Unless he could sell a CD ROM for under $600, he said, he would not market the technology. Consumers, he said, are used to seeing audio digital players for $199. Why should they pay $1,000 for the same mechanism hooked to a computer? "I'm not willing to lose money," he said.

Tramiel felt no compulsion to be the first company to release a CD ROM. When would he get it out? "You'll have to guess and I'll have to know." However, **Antic** has since learned that a CD ROM player will soon be available from Sony for about $300, so the arrival of an Atari-labelled player may not be that remote after all.

GEM IN ROM

According to Jack Tramiel, by the time you read this, GEM should be placed in ROM chips. At the time we spoke with him, he told us it would be "a matter of days, not months."

*(FLASH! Just as **Antic** went to press, we learned that GEM is finally in ROM. The new chips were expected to be available at authorized Atari Service Centers about January 1 and should cost about $25 installed.)*

Also, it looks as if the ST GEM Desktop will maintain its familiar appearance in spite of the Apple attack on Digital Research, Inc. Atari had been working with DRI's attorneys and, Tramiel told **Antic**, DRI had "indemnified" Atari.

Although the Atari spotlight was focused on ST software, several hard disks were lent to third-party exhibitors by Atari. The hard disks were being sent to developers but Atari expects them to be available to consumers by first quarter of 1986. No firm price was mentioned, but they hope to keep them under $600.

continued on next page

BORLAND BUYS STS

Borland International, developer of the extraordinarily successful Turbo Pascal and Sidekick, "is committed to write software on the ST," according to Sig Hartmann, President of the AtariSoft Division.

Another top Atari official told **Antic** that Borland president Philippe Kahn, after returning from the October Munich Computer Show, went directly to Atari and handed over a check for three STs.

Atari management told us that Germany is perhaps their biggest market at present. The latest isssue of a major German computer magazine, CHIP, showed the 520ST to be the best selling computer in Germany after only two months on the list.

CHIP editors also informed Jack Tramiel that a nine-magazine international poll chose the 520ST as the best personal computer.

When asked why sales were so good in Germany, Tramiel replied, "Obviously, the Germans are smarter buyers."

DEGAS Art Competition

You can still enter!

You still have a chance to win some of the $2,000 worth of cash and software prizes in the **DEGAS** Art Competition, sponsored by Batteries Included and judged by **Antic** magazine. Create an Atari 520ST picture with BI's powerful new DEGAS paint program, reviewed in the February 1986 **Antic**.

There are two grand prizes of $500 cash—one each for the best color and best monochrome picture. Five runner-ups receive a selection of ST software from the Antic Catalog and BI, plus one-year subscriptions to **Antic** Magazine.

Entries must be received by March 31, 1986 at **Antic**, 524 Second St., San Francisco, CA 94107. Only registered owners of DEGAS software may enter the DEGAS Art Competition. Complete rules can be found inside specially-marked DEGAS software packages, along with the official entry form which must accompany each disk entered in the competition.

ST PRODUCT NEWS

ST reviews

HIPPO DISK UTILITY
Hippopotamus Software
985 University Avenue
Los Gatos, CA 95030
(408) 395-3190
$49.95

Reviewed by Patrick Bass

Sharing a million characters between computer and disk can be really nice—until you go looking for one five-letter word somewhere in all that. If you don't know where the word is stored, you may wind up feeling like Stanley looking for Livingston through deepest, darkest RAM/ROM, or deeper, darker DISK.

If you ever found yourself in a situation like the one described above, then you owe it to yourself to get the **Hippo Disk Utility** for the Atari 520ST.

Retailing for only $49.95, this software could save you hundreds of dollars in lost programming time. In fact, we use it at **Antic** on our own 520STs.

Hippo Disk Utility for the ST (DUST) allows the user to search for any string of characters or numbers anywhere information is stored in the ST system—on disk, in specific disk files, or most importantly. . . inside memory itself! It also allows direct editing of information found in RAM or on disk.

No matter where you ask it to search, DUST presents a full "page" of information (256 bytes or 1/2 sector) on the screen at one time, in both hexadecimal and ASCII formats, so you can easily scan through words. If you prefer the computer to do the searching, DUST allows the user to enter a search string, consisting of as many as 16 bytes of either words or numbers, and it will find all occurrences of that string wherever you tell it to look.

An even more powerful feature of DUST allows direct editing of the information you call up on the screen. Just move the mouse pointer until it points at the word, or number, or memory address you need to change. Then single-click and, when a block cursor appears, type in your correction. DUST will verify whether you really want to change the string.

If you accidentally delete a file, don't worry. DUST will take care of it. It also allows you to copy, print, rename, delete, or *wipe* a file completely and irretrievably from the disk. You may also interrogate the disk as to its title, type, and amount of space currently in use.

Up to 16 disk drives are supported, from disk A: to disk P:. DUST can change the "attributes" of a disk file, which would allow the user to render a file *invisible* to a directory search. Or DUST can change a file from "read/write" to "read only." You may also create or delete directories and sub-directories.

Hippo Software uses the GEM interface fully. All Hippo software reviewed by **Antic** so far has made full use of the drop-down *menus, mouse* pointer, and Alert/Dialog boxes. In

continued on next page

turn, this makes learning to use any of the Hippo products easy and fast.

But I do wish the program was better trapped for errors. If you try to look at areas of memory that are not there, the utility crashes right to the Desktop. C'mon fellas! who needs this?

HIPPO SIMPLE
Hippopotamus Software
985 University Avenue, Suite 12
Los Gatos, CA 95030
(408) 395-3190
$49.95

Reviewed By Gil Merciez

Ever since the arrival of home computers, database and filing programs for personal use have been a solution in search of a problem. The effort required to master this type of program, enter the data, and maintain the database has seldom proven productive for the average home user who doesn't have massive amounts of information to organize. The whole operation quickly turns into a large chore. Index cards usually win out.

HippoSimple, from Hippopotamus Software, is the first general purpose database to hit the shelves for the ST. Geared to the home market, HippoSimple promises ease of use, flexibility, and power in organizing those smaller mountains of paper that clutter your desk. It nearly succeeds.

Extensive use of the mouse, drop-down menus and dialog boxes make navigating through the program a breeze. Mastering HippoSimple is quite easy, as soon as you grasp the concept of the four templates used for inputting and outputting the records in your database.

These templates control which records are involved in many of the available commands such as viewing, sorting, printing, and deleting. Templates can be saved separately for use with a variety of database files.

As an example, I started a database of software that was available for the ST or would soon be. One input template was set so that only records with the "available" field equal to "yes" would be passed through it. The other template only passed those records where the "available" field equalled "no".

The entire database is RAM resident, so the available memory of the ST is the limiting factor in how much information you can work with.

HippoSimple does not require that you first define a fixed field length. Data compression techniques reduce dead space to a minimum. You can add a field to a record whenever you wish. Not all records have to contain the same fields. A field is defined when an equal sign [=] appears directly after its name.

An online help manual is available from the drop-down menu and is organized into logical topics. Screen editing and file commands are accessed either through the drop-down menu or the function keys.

Unfortunately, version 1.0 seems to have been rushed to market a little too quickly.

First shipments of HippoSimple were sent without a printed manual. Hippopotamus said that the 63-page manual would be sent to all owners who returned their registration cards.

While most of the printed manual is contained in the online help files, the book also includes a short, but valuable, tutorial as well as an index and a command summary.

Trying to learn HippoSimple from the help files was extremely frustrating, particularly when you have to constantly refer back to them while trying to set up a file.

The documentation also suffers from some omissions. Nowhere is it explicitly stated that the capacity for a record is 16 screen lines.

One nice feature, a vertical scroll bar which can quickly move through many records, is not mentioned.

There is no warning of any limitation on field lengths, but the output template will not handle a field longer than 80 characters. This can cause some messy output when printed or viewed.

A dialog box shows the capacities and current usage for the database in memory but doesn't explain what the four criteria mean. Some dialog boxes confuse you with a YES/NO choice when an "OK" would suffice.

A rewrite of the documentation would go a long way in making HippoSimple truly simple for its intended audience.

HABAWRITER
Haba Systems
6711 Valjean Avenue
Van Nuys, CA 94106
(800) HOT-HABA (USA)
(800) FOR-HABA (Calif.)
$74.95

Reviewed by Ian Chadwick

Probably the most indicative thing to say about Haba's word processor for the 520ST is that I'm not using it to write this review. It's not very reassuring when you don't feel you can write a review of a word processor using the program itself!

HabaWriter is one of those programs that seems to have been rammed through production and testing in order to gain market presence before anyone else.

I am a professional writer and have used several word processors on a half-dozen microcomputers—including the Macintosh—to ply my trade. HabaWriter is essentially patterned after MacWrite, Apple's popular Macintosh word processor. HabaWriter makes good use of the GEM interface—windows, drop-down menus, scroll bars, multiple documents through windows, graphic fonts and dialog boxes.

HabaWriter documentation omits several important items and its explanations of covered topics are terse, to say the least. Many features are buried or explained ambiguously. An "errata" sheet accompanies the slim manual to try and cover problems discovered after printing. But these problems *should* have been caught during alpha and beta testing.

One of the HabaWriter problems not dealt with in the manual is double spacing. The program doesn't handle anything except single spacing. Also, when loading a document from another word processor—STWriter for example—you get strange results such as blank lines, un-

expected spaces, ignored carriage returns and the like.

Haba's own letters from their **Business Letters Solutions** disk won't format properly with HabaWriter! You get one large block of text if you attempt to format one of the business letters. All carriage returns and formatted paragraphs are gone.

At other times, HabaWriter crashes randomly or produces strange and unpleasant results such as duplicating lines of text when switching to or from ASCII mode. Some files seem to generate unwanted characters when loaded into HW. A C source file from CompuServe added small triangles.

In the same document, very long lines seemed to confuse the hyphenation routine which continually asked for hyphenation of groups of blank spaces and wouldn't quit asking me to hyphenate the same spot over and over again. Holding down the [RETURN] key during this process produced several thick black lines running down the screen. [ESCAPE] cancels the hyphenation mode, leaving your document partially formatted at the point you escaped.

I also had my share of difficulties making the text on the screen accept my commands. I couldn't get paragraphs to align individually left, center or right, or to obey all my margin changes every time. Also, although the document is supposed to format only from the cursor down, it sometimes formatted from the beginning.

HabaWriter can open as many as seven documents in different windows and cut and paste between them. You can also selectively print a document, choosing only those pages you prefer (and not merely a sequential group). Only an Epson printer driver is provided, and there's no explanation of how to create one for another printer. Text is supposed to be aligned by any character, not just tabs and decimal tabs—useful for creating tables and charts. However, tabs did not work as described and didn't align properly.

Unfortunately, any good features in HabaWriter are hidden by its flaws and bugs. I have had it crash on me too often, returning me precipitously to the desktop. I have lost documents I was working on by selecting a format or ASCII mode which either destroyed or permanently altered my text in an unwanted manner. The cursor would vanish at random for several moments at a time, leaving me with no control over the screen. Blocks that I selected would de-select all or part of themselves unasked.

Despite all this bad news, HabaWriter shows promise. But it needs a major overhaul before it can be considered even minimally competent. This software demands proper, correct and more detailed documentation; and adequate testing and development. Haba should examine the Mac products seriously before upgrading this program to discover what they are also missing.

continued on next page

HIPPO SPELL
Hippopotamus Software
985 University Avenue, Suite 12
Los Gatos, CA 95030
(408) 395-3190
$39.95

Reviewed by Brad Kershaw

Is your speling poor? Are you constantly luking up words in the diktionery? Well, never fear, **HippoSpell** is hear. . .

HippoSpell is a spelling checker that enables you to correct spelling errors with any word processor currently available for the Atari 520ST — ST Writer, Express, HabaWriter and Regent Word 1.

After you use the drop-down menus on the opening screen to choose a file, HippoSpell immediately starts checking your spelling. The software finds the first word it thinks is misspelled and asks you "Is this a correctly spelled word? Yes or No? I don't know about you, but if I knew whether the word was correct or not, I wouldn't need the program.

If you answer "Yes," the program continues checking. If you answer "No," it looks up words that may be similar in spelling. The program is very fast because all the words seem to be in RAM. A list of possible replacement words is shown. You can choose one of these words by simply pressing a numbered function key or you can type it in. Once you have gone through the entire file, HippoSpell will make the corrections for you and rewrite the finished product to your disk.

You can build an auxiliary dictionary that saves correctly spelled words which the program didn't find in its main dictionary. This auxiliary dictionary is accessed via the Use New Words menu option. Also, corrections can be saved and reloaded for automatic use if you tend to repeat the same mistake, such as typing "Bard" instead of "Brad."

The only thing I thought could be improved is that HippoSpell's screen just displays a single word it thinks is misspelled. You cannot see the suspect word in the context of its sentence.

I found HippoSpell easy to use and a helpful composition tool. It should be part of any writer's ST software library, especialy mine.

FORBIDDEN QUEST
Pryority Software
25570 Chiquito Place
Carmel, CA 93923
(408) 625-0125
$39.95

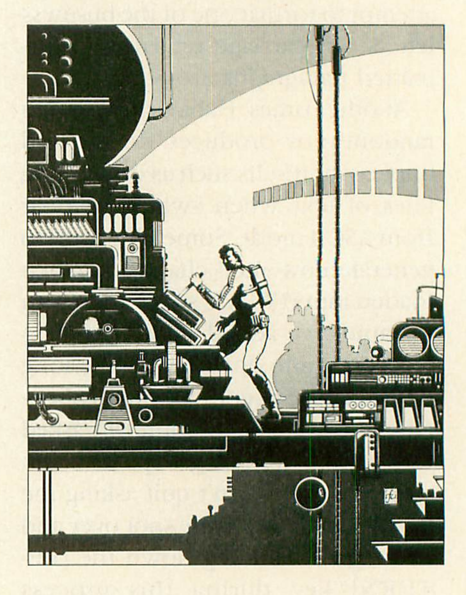
Reviewed by Harvey Bernstein

As all true Atarians probably know, the wait is over, the flood gates have been opened, and a battery of new products are being shipped for the 520ST. Unfortunately for us adventure-game players, that category has been among the slowest to develop. Infocom, of course, came on the scene early using their own easy-to-convert Adventure Development Language. Now they have been joined by Pryority Software, which brings us **Forbidden Quest**, a somewhat original text adventure.

Actually, the game is not all that new, having originally been released for the Apple II and Macintosh. But since it is all text, it was a simple matter for the program to be ported over. Several elements make Forbidden Quest distinctive, but unfortunately the storyline is not one of them. Once again, you are a space jockey seeking a mysterious race whose superior knowledge can save mankind from a rising barbarism brought about by some future galactic civil war.

Along the way you encounter the usual collection of puzzles, mazes, and mysterious artifacts. What lifts F.Q. above the mundane is a technique the developers call "Artext". Simply put, Artex is a series of five drawings that convey information not provided in the text. At certain junctures, you match the name of the room to the appropriate drawing in order to gain information that will help you succeed.

A problem with this method is the game's somewhat limited vocabulary. For instance, is that bank of controls in drawing #2 to be referred to as a machine, a control panel, or a doohickey? As you'd imagine, this can be quite frustrating. The drawings are nicely done in "Amazing Stories" pulp-magazine style. (One is even by the famed EC comicbook artist Wallace Wood.) But I suspect they were



mainly added as a marketing gimmick that also provided some sugar-coated copy protection.

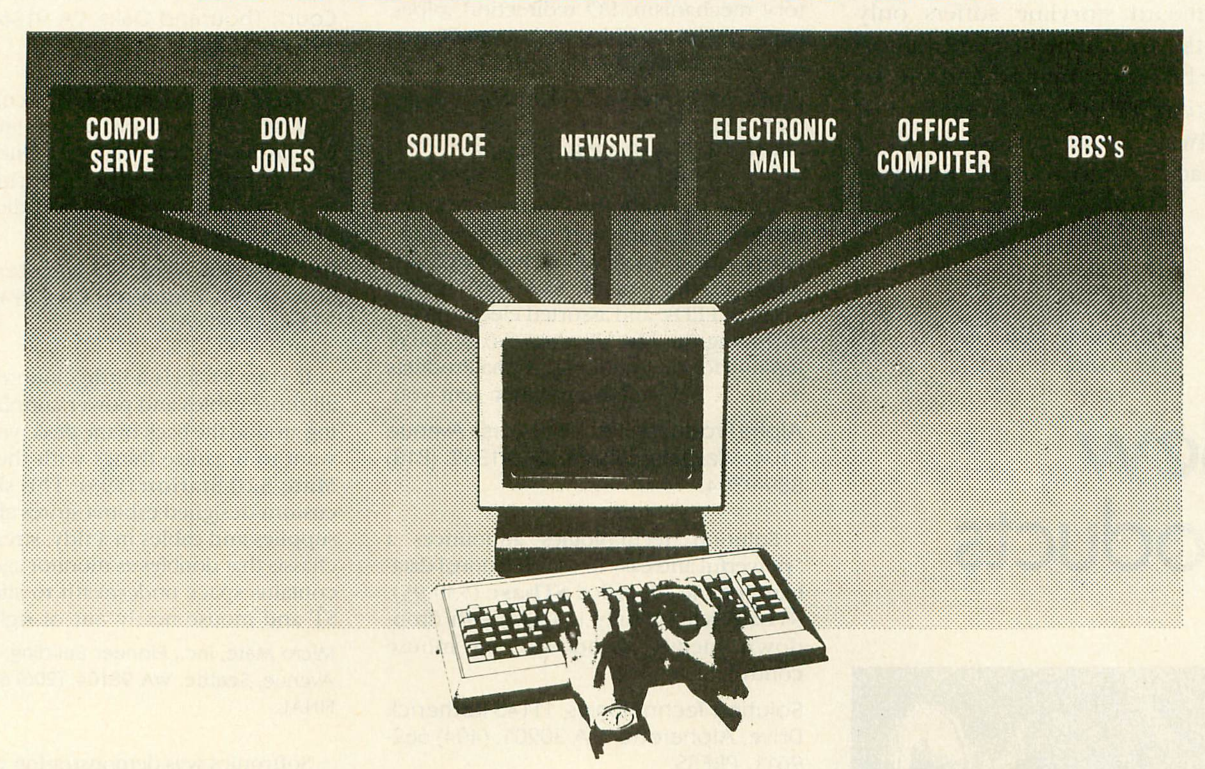
Forbidden Quest is the first game I've seen that really takes advantage of the GEM interface. After the game boots, a series of drop-down windows are in place. One is for inventory, and replaces the standard typed-in "Inv" command. A checkmark next to any item listed in the box indicates it is being worn, and you can examine an inventory item by pointing and clicking with the mouse. You can also use the mouse to move from room to room by pointing and clicking on a compass at the lower right of the screen. However, I found that typing in standard N,S,E,W direction commands was less cumbersome.

Other drop-down windows are used for saving and loading games, issuing oft-used commands such as look, wait, etc. Hints are also available, but you lose points whenever you take a clue from any of the three levels of online help. Even the ST desk accessories are available so you can, for example, pull up the Control Panel and change your colors if you wish.

Forbidden Quest is a well-done standard text adventure. The puzzles

continued on page 72

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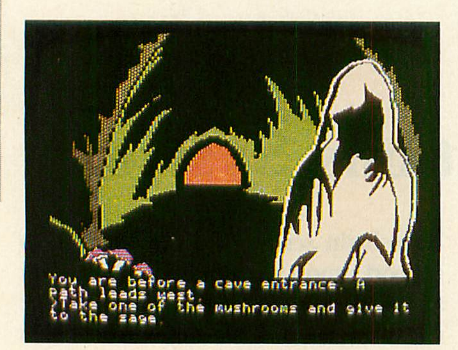
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In Connecticut call: 597-0273



continued from page 70

are logical and help is just a click away. Its standard storyline suffers only from the inclusion of some unfortunate bathroom humor. And the Artext prints are an interesting idea, if not always successful. All in all, a good addition to your ST library.

New Products



The Crimson Crown

Penguin Software just sent **Antic** two new graphics adventures for the ST. Their classic, **Transylvania**, and the fantasy follow-up, **The Crimson Crown** ($34.95 each). The Crimson Crown is the first in a series of "illustrated interactive novels."

Penguin Software, P.O. Box 311, Geneva, IL 60134. (312) 232-1984. FINAL.

Progressive Computer Applications is building a major business-graphics system based—interestingly—on a Computer Aided Design (CAD) core. **The Graphic Artist** ($495) will automatically integrate created images into spreadsheet data. Word processing will also be part of the package. An optional language interpreter ($245) may be purchased to customize the system.

Progressive Computer Applications, 2002 McAuliffe Drive, Rockville, MD 20851. (301) 340-8398. DEMO.

For those UNIX practitioners allergic to mice and windows, David Beckemeyer Development Tools offers **Micro C-Shell** ($49.95), a command shell based on BSD UNIX C. This comes complete with history mechanism, I/O redirection, pipes, environment variables, and a complete assortment of UNIX-style utilities.

David Beckemeyer Development Tools, 592 Jean Street #304, Oakland, CA 94610. (415) 658-5318. FINAL.

While scouting the elusive ST floppy drive connectors and monitor plugs, **Antic** came upon Alpha Products, Inc. which carries a whole slew of odd connectors, LEDs, and assorted electronics—including the rare ST plugs. So, if you're looking for this stuff, give Alpha Products a call. . . and tell them **Antic** sent you.

Alpha Products, Inc., 5740 Corsa Avenue #104, Westlake Village, CA 91362. (818) 889-9304.

Solution Technologies announces a "powerful and easy to use" relational database for the ST, called **STbase** ($39.95). STbase will be fully in GEM, with drop-down menus, windows and mouse control.

Solution Technologies, 11145 Rotherick Drive, Alpharetta, GA 30201. (404) 662-9611. PRESS.

XLEnt Software was showing **Typesetter ST** ($34.95) at COMDEX. This will probably be the first graphics/printer program for the ST— similar to XLEnt's fine 8-bit printer products (reviewed in **Antic** last month). Typesetter ST will come in two versions, one for RGB monitors and a monochrome monitor package for super high-resolution printouts.

XLEnt Software, P.O. Box 5228, Springfield, VA 22150. (703) 644-8881. DEMO.

Also at COMDEX was a demonstration of **Flight Simulator** (no price at press time) for the ST. With this version, you can choose to fly a prop plane, Lear jet, or WWI biplane. You can also open multiple view windows and simultaneously watch yourself from the cockpit, tower, and a spotter plane!

Sublogic Corporation, 713 Edgebrook Drive, Champaign, IL 61820. (217) 359-8482. BETA.

As an example of vertical product marketing, Word of God Communication is working with Atari to establish their **ComWORD II** in Christian schools throughout the country. This powerful educational software is a huge, 9.5 megabyte database holding the complete King James Bible, Strong's Concordance, plus Greek and Hebrew dictionaries for intensive cross-data referencing. Aimed primarily for institutional use, ComWORD II requires a hard disk. The company hopes later to place their software on CD ROM.

Word of God Communication, 88 Long Court, Thousand Oaks, CA 91360. (805) 495-4441. BETA.

Word for Word (39.95), a computerized blend of crossword puzzles and Scrabble, just landed on our desk. One to four players may participate at various skill levels and the program has a dictionary of over 20,000 words.

Bay View Software, 177 Webster Street, Suite A-295, Monterey, CA 93940. (408) 373-4011. FINAL.

If your ST feels a little cluttered, with all those cables and power supplies kicking around the back of the desk, you might want to organize things with the **Micro Mate 520 Station** ($95). This shielded, custom-designed cabinet stores all power supplies and cables in a tidy, streamlined chassis that doubles as monitor stand, and contains space underneath to slide your ST and mouse neatly out of sight.

Micro Mate, Inc., Pioneer Building, 600 First Avenue, Seattle, WA 98104, (206) 643-9697. FINAL.

Softronics was demonstrating what appeared to be the Rolls Royce of ST terminal software at the COMDEX show. **Com Pak** ($49.95) will emulate practically any existing terminal and includes hooks to configure, compile and create your own customized terminal modules.

Softronics, 10820 E. 45 Street, Suite 206, Tulsa, OK 74145. (918) 664-0955. BETA.

New ST product notices are compiled from information provided by the products' manufacturers. ***Antic*** *assumes no responsibility for the accuracy of these notices or the performance of the product. Each mention is followed by a code word indicating that, at press time,* ***Antic*** *had seen a FINAL marketable version, near-final BETA, earlier ALPHA, incomplete DEMO, or PRESS release.*



moon



LUNAR LANDER CONSTRUCTION SET

Program by DANIEL DEIGHAN

Article by GIGI BISSON

Lunar Landers, games that simulate a space capsule landing on the moon, were among the first public domain programs. Now with Lunar Lander Construction Set you can easily create and save your own joystick-controlled space landing simulations. This BASIC program works on 8-bit Atari computers with 32K disk or 16K cassette.

Back in the old days, before Space Invaders, Player/Missiles, Asteroids and Moon Unit Zappa, there were Lunar Landers. Perhaps the oldest form of computer game, Lunar Landers deserve a place on computer memory lane right next to Eliza, Life and Pong.

These simulations of Apollo rocket ship landings, essentially working equations between velocity and gravity, were originally all-text programs on mainframes connected to teletypes. Later, micro versions written in BASIC on the TRS-80, Apple II, Commodore VIC-20 and Atari 400 became some of the most common public domain programs. Those early Lunar Landers tended to be boring, impossible to win, and generally unreliable. Sometimes the challenge was simply guessing which would crash first—your rocket or the program.

The old text-based lunar landers were loaded with complicated mathematical equations, fuel units and thrust percentages, but the programmers' strange sense of humor helped keep them from lapsing into total tedium. When you crashed your rocket, a message would appear: "Sorry, there were no survivors. You blew it! In fact, you blasted a new lunar crater 347.12 feet deep!," or "Too bad, the space program hates to lose experienced astronauts! Appropriate condolences will be sent to your next of kin."

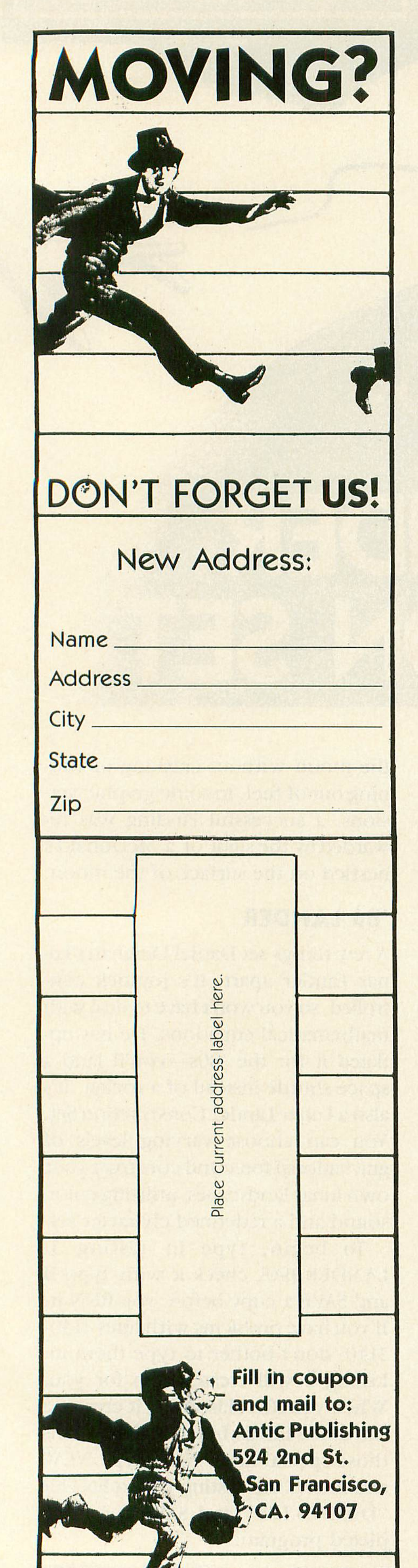
Eventually lunar landers became one of the first games with graphics and sound (only one sound, but that was a mean feat in those days.) Whether these early programs were called Lunar, LEM (after the Apollo Lunar Excursion Module), Apollo, Rocket, or Jupiter Lander, the mission was always the same—land safely on the moon without crashing or running out of fuel. In some graphic versions, a successful landing was rewarded by the sight of a McDonald's nestled on the surface of the moon.

'86 LANDER

A few things set Daniel Deighan's Lunar Lander apart. It's joystick controlled, so you won't have to deal with mathematical equations. He has updated it for the '80s—you'll land a space shuttle instead of a rocket. It's also a Lunar Lander Construction Set. You can choose varying levels of gravitational force and construct your own lunar landscapes, utilizing color, sound and a redefined character set.

To begin, type in Listing 1, LANDER.BAS, check it with Typo II and SAVE a copy before you RUN it. If you have problems with lines 1130-1140, don't bother to type them in. Listing 2 will create them for you. When you RUN Listing 2, it creates a file called LINES.LST which contains those special lines. Now, type NEW and then LOAD Listing 1, next ENTER "D:LINES.LST" and SAVE the completed program.

continued on next page



game of the month

BLAST OFF

Sally Ride was busy making a cereal commercial, so among hundreds of qualified shuttle pilots, you've been chosen to deliver high explosives to ore miners on several planets. Your job is to guide your cargo shuttle from a stationary orbit to the landing pad—very softly, because the space program hates to lose astronauts.

First, plug in one (or two) joysticks, then RUN the program. When the first lunar landscape screen appears, press [START]. The prompts will tell you to press [OPTION] to choose the number of players. Then press [SELECT] to choose your gravity level among nine different locations from Ganymede, the largest of Jupiter's moons, to Earth.

To play, press [START] and hold the button down for a second or two. Use the joystick to guide your shuttle through the intimidating alien landscape onto the landing pad, which is designated with flashing lights. You can go left or right, push the stick up to fire your main thrusters, or down to fire your less powerful landing thrusters.

If you land very softly (no easy feat) you will be given extra points. If you do a great job, you'll get bonus rocket fuel. If you blow it and crash, you'll get another chance. Land successfully twice, without running out of fuel, and you can advance to the next mission.

BUILD A PLANET

Now that you know what a lunar lander looks like, you can design your own lunar landscapes, modify the screens already loaded into the game, or even load a whole new version of the game with your own landing sites. Enter the constructon set by pressng [OPTION] and [SELECT] simultaneously. At the first prompt, you can choose whether you want to alter an existing screen or start from scratch.

If you choose to create a new screen, you will be asked if you want to load a previously saved screen. If so, first type in the device to load from (D: or C:). Otherwise the screen will revert to the figure selection menu.

If you choose to alter an existing screen, you will be asked which screen you want to work on. The screen will be displayed and you'll be presented with the figure selection menu.

Using your joystick, move the cursor (it's invisible, so this will be tricky) over the blue templates. Select little chunks of lunar turf, peaks and valleys by pressing the fire button. Then use the joystick to move the turf to the landscape screen, To put it in place, press the fire button as many times as you wish.

To create solid fills, use the square piece of turf on the far left of the template. To erase, move the invisible cursor over the first space, fire, then move it over any part of the landscape you want to delete. To position a landing pad, select the third portion of the template with a small blue spot on top of it—this represents the five characters that make up the landing pad.

Press [ESC] and follow the screen prompts to save your screen to disk or cassette for future play. Your screen design will replace one of the original game screens. When you choose the screen you want to replace, the bottom of the screen will clear.

Then you can watch as the computer writes the program lines that will create your new landing site. This is done with the Atari's forced read mode. (POKE location 842 with 13 and the computer will accept information from the screen as if it were typed from the keyboard.) To play your customized landing simulation, press [START].

Daniel Deighan is a host-bartender at Del's Restaurant in Pittsburgh, PA as well as assistant sysop of Nightlife BBS at (412) 343-0740.

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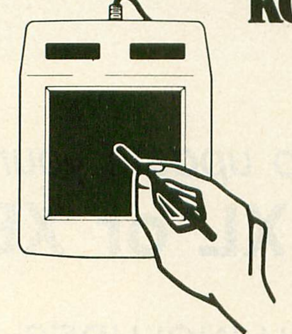
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EPSON FX-85

Epson America, Inc.
2780 Lomita Boulevard
Torrance, CA 90505
(213) 539-9140
$499

Reviewed by Eric Clausen

Epson represents to the dot-matrix printer market what BMW and Mercedes represent to the automobile market—quality, dependability, performance and, of course, price! The FX-85, successor to the widely used FX-80, is no exception.

The impressive new FX-85 offers virtually every feature conceivable in a 9-wire dot-matrix printer. If you can think of a printer feature, it's available for the FX-85, either built-in or as an option. If you want substantially better performance from a dot-matrix printer, you'll have to move up to one of the new 24-wire models—at perhaps twice the cost. (See review of the Star SB-10 in **Antic**, February 1986.)

123456789:;<=>?@ABCDEF
23456789:;<=>?@ABCDEFG
3456789:;<=>?@ABCDEFGH

Near Letter Quality

123456789:;<=>?@ABCDEF
23456789:;<=>?@ABCDEFG
3456789:;<=>?@ABCDEFGH

Draft Mode

The FX-85's near letter quality mode is the finest I've ever seen on a 9×9 dot-matrix printer. (See the accompanying print sample.) Proportional printing is supported, along with all standard fonts and their variations—pica, elite, italics, expanded, emphasized, compressed, super/subscript, etc. Custom fonts can be downloaded to the printer in draft mode only.

One of the most useful features on the FX-85 is "SelecType," which enables the user to switch back and forth between different fonts by simply pressing buttons on the front panel. No more fiddling with inaccessible DIP switches for this simple task!

As far as DIP swtches are concerned, the FX-85 makes these easily accessible beneath a panel on top of the printer. Naturally, all printer defaults can easily be altered with these switches, including selection of international character sets and a standard IBM character set. Software compatibility is almost a non-issue with any Epson printer. If a commercial program works with a printer, it works with an Epson.

The FX-85 is quite fast, considering the high quality of its printed output. **Antic** tested the speed of this printer at 105 characters per second in draft mode and 20 cps in near letter quality mode. The FX-85 also seems much quieter than many of its competitors.



The FX-85 operates bidirectionally in text mode and unidirectionally in graphics mode. It has a standard-width carriage with pins for continuous-feed paper, as well as friction feed for single sheets. However, if you want to print labels, you'll need a $35 adjustable-width tractor. An automatic single-sheet feeder costs $289.

The documentation supplied with the FX-85 is easily the finest I've seen with *any* printer. Every aspect of the FX-85 is covered thoroughly. Printer manufacturers should emulate Epson documentation, as well as Epson printer control codes. If you do have a technical question concerning the FX-85, I've found Epson telephone reps to be very polite, knowledgeable and willing to help.

The FX-85 has an 8K memory buffer which can be upgraded to 32K for $180. The printer requires a Centronics parallel interface to work with 8-bit Ataris. An IBM-to-Centronics cable is all that's needed for connection to the 520ST.

If I could justify the purchase of a third dot-matrix printer, I would buy the FX-85 (with tractor) without hesitation. If you need a top quality 9-wire dot-matrix that can do everything short of the dinner dishes, and you can afford a premium price, give the Epson FX-85 very serious consideration.

SILENT SERVICE

MicroProse Software
120 Lakefront Drive
Hunt Valley, MD 21030
(307) 667-1151
$34.95, 48K DISK

Reviewed by Rich Moore

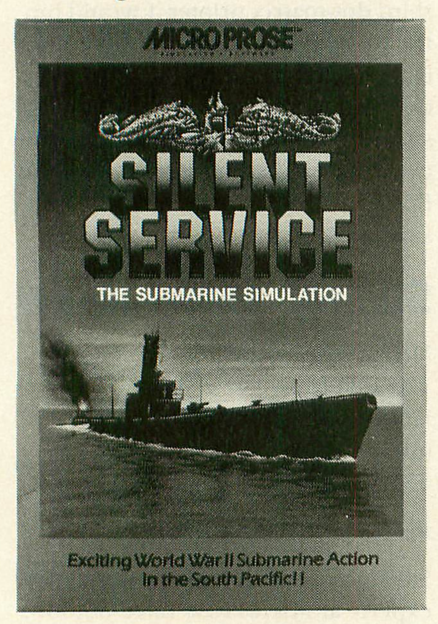
Sid Meier and his team of simulation experts at MicroProse have outdone themselves with **Silent Service**, a recreation of submarine operations in the Pacific during World War II. As a U.S. fleet submarine skipper, you can almost smell diesel oil and feel the deck rolling beneath your feet while searching the western Pacific for Japanese shipping.

Beginners can immediately take up target practice, while veterans can proceed to complex, historically accurate and challenging war patrol scenarios. In between are a variety of convoy actions, good for practicing tactics. You can gradually make things more realistic by limiting detection capability, allowing convoys to zig-zag, contending with dud torpedoes,

continued on next page

performing repairs only in port and taking on tougher Japanese escorts. When you get an experienced "seaman's eye," you can elect to manually provide "angle on the bow" for torpedo shots.

Some things are not optional, like fuel and battery consumption or number of torpedoes remaining, as well as which tubes (bow or stern) they're in! Exceeding the crush depth is not recommended. And your sub can run aground in shallow water or



be rammed by a ship if you're not deep enough! Depth charges and destroyer gunfire can ruin your whole day, but a thermal gradient in the water may save your ship. You have 80 shells for the deck gun, which may require some range adjustment for target motion . . .

The graphics are superb. Master control is from the viewpoint of the conning tower screen, which can then take you to the bridge for a wide-angle view of the area. Maps and charts provide a bird's-eye tactical plot and the instruments tell you what the sub is doing. Damage reports give you a full-length view of your "boat" and the status of its major components. The view of cargo ships and tankers through the attack periscope is terrific, especially when it also shows the wakes of a spread of torpedoes speeding off toward their targets. The sight of angry escorts turning toward you will generate more than a little anxiety, particularly where the water is shallow. . .

The manual is extremely well done. A "quick start" section lets you jump right in for target practice or convoy hunting. But most people will need to "refresh" their submarine tactics before going on to the more advanced scenarios. The manual provides everything you need to know, in several very interesting sections.

Keep in mind that submarine warfare is *slow*. You must evade the convoy escorts to do any damage. To make the simulation run faster, game rate can be accelerated to 32 times real time. Patrol mission transit time is effectively "stepped" by driving the sub across the patrol screen with the joystick. A submariner once told me, "You guys are in too much of a hurry. The destroyers want to strike at 0420, the aviators go when it's dark outside and both Mickey's hands are on the '4,' and the submarines just attack on Tuesday." Be patient, use stealth, and good hunting!

POWERSTAR

Pandora Software
177 Carlton Lane
North Andover, MA 01845
$34.95, 16K cartridge

Reviewed by Harvey Bernstein

Pandora Software, a new company in Massachusetts, has come up with a unique idea—**Powerstar**, a graphic adventure on a cartridge. There's no wait while your disk loads, no lengthy disk access between screens. You can play Powerstar even if you have no disk drive and a 16K Atari.

The game has several unique features. For one thing, movement is not accomplished with the standard "Go North" type-in command. Instead, you use the arrow keys or joystick. A prompt on the command line tells you which direction you are facing. You then move forward (providing there is an exit).

As a result of this unusual approach, you are told almost nothing about a new room. You must make a 360-degree search of the area in order to discover any useful objects and exits. This, coupled with the instantaneous screen updating made possible by the cartridge, adds quite a bit to the "live" feel of the game.

The story in Powerstar is not unfamiliar. As a technician in the ground station, you become aware that something is dangerously amiss aboard Powerstar—the man-made satellite that is the source of all the Earth's power. It is up to you to make your way to the station and right everything again, while facing the usual dangers and puzzles.

Powerstar also attempts something new in the way of graphics. Most previous graphic adventures, having been originally written for the Apple, use Graphics 7+ for their pictures. Powerstar is the first adventure I know about that makes use of the unique Atari GTIA chip. The screens are all Graphics 10, which is a mixed blessing. The colors are vivid and some images are nice, but others are blocky and look low-res.

I applaud the folks at Pandora for providing a fine first effort with Powerstar, despite a couple of complaints. First of all, some of the puzzles have illogical solutions. It was only due to the hint sheet we received that I discovered something described as a "cryogenic storage tank" actually was a fuel tank. Cryogenics has nothing to do with fuel.

Also, there are two mazes that do not seem to be mappable, even using the tried and true "Hansel and Gretel" technique of dropping things. Only

with luck will you find your way through, and you must make it through both to finish the game. Worst of all, the game does not understand the command "examine ---". To a veteran adventurer, this is the ultimate frustration.

As stated at the beginning of the review, Powerstar can be played without a disk drive. But you still need a disk to save games in progress. Otherwise, be prepared to start from scratch several times. It would have been simple to include a routine for saving to cassette. Still, Powerstar is an impressive debut overall and raises hopes for even better things in the future from Pandora.

KARATEKA

Broderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
$29.95, 48K disk

Review by David Plotkin

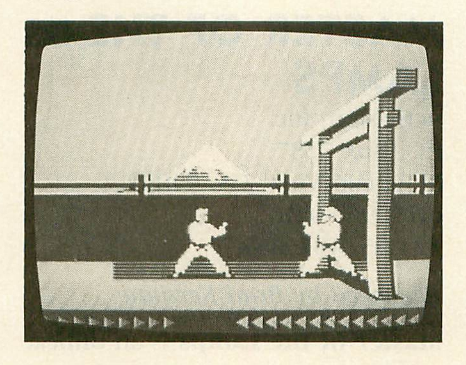
Karateka is an action/adventure game with a karate theme. Excellent graphics and character animation make it very enjoyable to play, despite some problems with the joystick control.

The storyline is about the only thing that an experienced gamer will find familiar. Your fiancee has been stolen away by the evil warlord. It is up to you to battle with increasingly competent minions of the warlord, so that you can gain entry to the castle and win her back.

You have no weapons and must depend entirely on your skill in the ancient art of karate. As the game begins, you have just climbed up onto the rock bluff where the evil warlord's castle roosts. You immediately face your first opponent.

Various karate moves are accomplished with the joystick and button. If you defeat the first foe (which is fairly easy), you then begin moving closer to the castle, stopping periodically to do battle. Each new enemy is fitted with different headgear to make him recognizable. This is important, since each opponent has his own fighting style and weaknesses—which you must learn in order to stay alive.

This becomes the most challenging aspect of the game—expect to play Karateka many times before mastering the skills you need to even enter the castle! The bottom of the screen shows both your remaining endurance and that of your opponent. Each blow you land will reduce your opponent's strength. Likewise, your strength will be reduced when you are hit. If your strength drops to zero, the game is over. No multiple lives here!



Graphics and animation are where Karateka really shines. The details are cartoon-quality, and the karate moves are amazingly realistic, right down to the swishing of the robes as you throw a kick or a punch. You may even bow to your opponent. (Be sure to assume the fighting position before he moves to attack or it will be a very fast game.)

The highly detailed backround scrolls smoothly and realistically. Graphic intermissions showing various scenes in the warlord's chambers while you approach the castle are true works of art. Karateka does have some problems, notably in the joystick-based control system.

The Atari joystick has only one button, and you must control both kicking and punching with it. As in **Choplifter**, you press the button slowly to kick, and quickly to punch. But in the heat of battle you will often find yourself executing the wrong move, sometimes with fatal results.

This problem is compounded by the fact that response to your joystick commands is often slow, and sometimes your input is ignored altogether. This can be extremely frustrating until you practice enough to become accustomed to the control system. There is also not tremendous variety in Karateka. Beyond the differences in fighting styles, you are basically just fighting one opponent after another, until you either die (very likely) or win.

All in all, Karateka is fun and extremely addicting. Loss of a game is almost always attributable to a poor choice of strategy. So it is very tempting to play "one more time" (sometimes until 2 a.m.) in order to correct your error.

PASTFINDER

Activision
P.O. Box 7287
Mountain View, CA 94039
(415) 940-6044
$24.95, 16K cartridge

Reviewed by Dave Plotkin

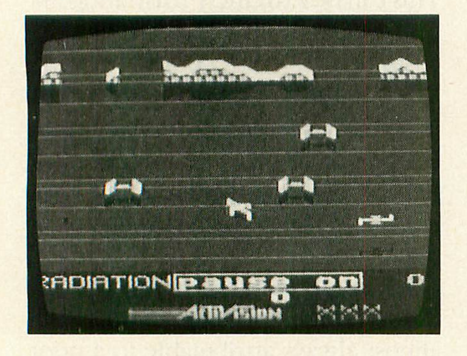
In **Pastfinder**, you are a stellar explorer navigating your surface vehicle across a scrolling landscape littered with all manner of obstacles.

The object is to pick up historical artifacts (which look something like dinner plates) and deliver them to bases scattered across the planet. Two major barriers oppose the completion of your mission. The first is the land itself, large portions of which are intensely radioactive. Fortunately, you have a radiation gauge and alarm, as well as anti-radiation devices.

Also formidable is the planet's au-

continued on next page

tomated defense system, with a multitude of hovering barriers, opening and closing doors, rising and falling columns, fixed obstacles, and a rather nasty drone ship which zeroes in on you unerringly. Some of the defenses can be destroyed by your shots, others simply avoided or leapt over. Oh yes, pushing the joystick forward causes you to hop into the air, which is awfully handy.



As you start the game, you are presented with a screen showing a very small portion of the overall planet map. As you explore, more of the map can be seen. You will return to the map screen after every sector. You choose a direction by using your joystick to move an indicator line across the map. The degree of radioactivity is indicated by the map colors—watch out for red!

After choosing a direction, you move to the weapons screen and choose your equipment. Some, like the beam shield and heavy metal, remain active until you lose a ship. But the deradiator can only be used once. To replenish your supplies, you can pick up spares which are scattered about the landscape.

Now you are ready to fight your way to the end of a sector. The speed and direction of your vehicle is controlled by your joystick. Some experimentation will quickly show you what you can and can't get away with. Particularly tough are the lines of moving columns, which march across the landscape in your path. Try to shoot the floating crystals, as this removes radiation.

For both playability and graphics, Pastfinder is excellent. The smooth, colorful animation of the screen obstacles is very well done. The scrolling effect is superb and the perspective is extremely realistic. The obstacles even cast shadows on the landscape. I just wish that the instructions provided diagrams to illustrate the items you are searching for, such as bases. Furthermore, I have some doubts about the arrows which are supposed to indicate the direction to a spare ship. I have found extra ships pretty much by luck. Still, this is all minor and I must say that I immensely enjoy playing Pastfinder.

MASTER OF THE LAMPS

Activision, Inc.
P.O. Box 7287
Mountain View, CA. 94039
(415) 960-0410
$24.95, 48K disk

Reviewed by Brad Kershaw

Master of the Lamps is an offbeat game program with a number of unique elements.

The storyline is as follows: when the King died, his four genies escaped from their lamps and took over the kingdom. You must aid the young prince by helping him fly his magic carpet through the tunnels into the genies' dens. There you must answer their riddles. If you are successful, they will return to their lamps.

When you start the game you are confronted with three joystick options—Seven Trials (easiest), Throne Quest (more difficult) and Magic Carpet (practice flying through all 21 tunnels).

When playing at the Seven Trials level, you must walk the little prince over to the magic carpet in order to begin flying through space. You see little diamond-shaped figures in the far distance, which begin to grow larger as you fly towards them. These diamonds are the tunnels. They will bob and weave in all directions. You must align your flying carpet with the tunnel centers to make it through to the genie's den.

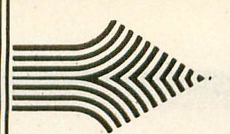
In the genie's den you will be standing with a mallet, in front of eight different colored gongs. The prince must call the genie by hitting any one of the gongs three times. The genie will appear in the upper left corner of the screen and begin blowing smoke rings. Each ring will become a different colored note, with accompanying sound. You must hit the colored gong that matches the note blown by the genie in the sequence given.

If you are successful, the genie will give you one of the seven pieces of the the magic lamp. You must then fly again through the tunnels to the next den. Each time a genie appears, he will offer one more smoke ring than the previous den. When you possess all seven pieces, the genie is imprisioned.

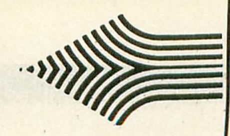
At the higher level, Throne Quest, there are three genies with seven dens each. The tunnels also move more quickly and are harder to navigate. The first genie will blow smoke rings as before. But the color of the note fades quickly, so you must remember the colors. After this genie is imprisoned, you go after the second genie, whose smoke rings give only color, without sound. The last genie is the hardest because you must respond to smoke rings which are sound only, minus color clues.

I enjoyed playing Master of the Lamps although it does become a little monotonous after awhile, flying to the den and hitting the gongs, flying to the next den, etc. . . . However, it is a nice change to see a non-violent game these days.

continued on page 82



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OPERATION MARKET GARDEN

Strategic Simulations, Inc.
883 Stierlin Road, Bldg. A-200
Mountain View, CA 94043
(415) 964-1353
$49.95, 48K disk

Reviewed by Rich Moore

Operation Market Garden is a fairly complex war game for one or two players—who should already be familiar with World War II army operations in Europe. It has both intermediate and advanced game options as well as four levels of handicaps for Allied forces. The player can choose to see all enemy forces, or only those units which become adjacent to his own.

"What if" gamers can change the historical Allied starting positions and pick either historical or random weather—with the subsequent effect on airpower. It's a little expensive at $49.95, but devout wargamers may enjoy trying their hands at making Field Marshall Montgomery's overly bold plan succeed.

Gameplay itself is not particularly hard. Some of the "advanced" features actually make it easier. On the other hand, some *requirements* of the advanced game will require constant attention to detail. The most difficult aspect of the game is its assumption that the player is *very* familiar with the forces and terminology of the period—which will certainly limit the number of people who can play. Just a little more effort in the manual would open it up to a much wider audience of wargamers.

Players actually have several roles. Decisions must be made by the overall commander as well as at divisional, regimental and battalion levels. Since play proceeds by turns, there is plenty of "real time" to analyze situations and carefully take action—hasty keystrokes can be extremely costly. Liberal use of the SAVE GAME feature permits recovery from accidents of all sorts. The keyboard-only input is fine except for cursor movement, which is somewhat awkward and a common cause of accidents in the advanced game.

The game includes two large plastic-coated cards with maps and parameter lists. These are invaluable for getting the big picture and planning overall movements. The redefined character set in the scrolling Graphics 2 screen takes some getting used to. But it is good for locating units and setting up lower echelon actions.

A word of caution for gamers whose Ataris have hardware modifications. The program will not work properly on machines which "see" more then 48K of RAM. When SSI specifies 48K systems, they really mean it. The problem can be fixed with an extra four bytes of code, but you need to know *exactly* what you're doing to the protected disk.

Operation Market Garden is not for everyone, but it should appeal to wargamers whose special interest is World War II. Persistence, imagination and prudent use of forces can pay off—with you actually taking that "one bridge too far!"

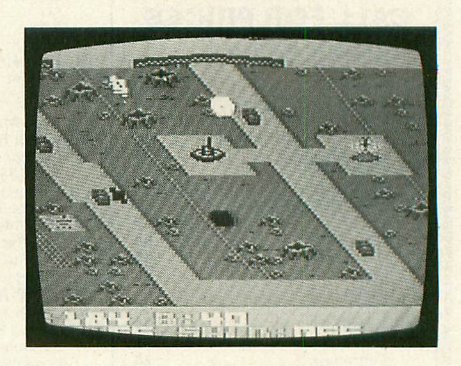
BLUE MAX 2001

Broderbund/Synapse Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
$29.95, 48K disk

Reviewed by Scott Lewis

Like the original Blue Max, **Blue Max 2001** is a 3D shoot-em-up arcade game featuring fairly good graphics and some interesting touches. Your basic mission is a combination of downing enemy aircraft and bombing ground targets. Landing fields appear at regular intervals. By successfully landing you can replenish your supplies and have your aircraft repaired.

The main difference between the old and the new games lies in the type



of aircraft used. Instead of a World War I biplane, the player pilots a hovercraft in Blue Max 2001. Airspeed is unimportant and landing much easier. Crashing into other aircraft is not usually fatal—in fact, it is the preferred method of elimination, as the hovercraft's guns fire in a completely erratic pattern, making aiming a matter of pure chance. It is even possible to use the Buck Rogers method—flying wildly about, shooting at random and trusting in the gods of Irrational Numbers—and still rack up a passable score.

Various player options and levels of difficulty can be selected. The documentation, unfortunately, appears to have been written in some other language and translated three or four times by volunteers. This means that the first half hour of play can be quite frustrating as you try to figure out exactly what is going on. In the end, though, it is well worth the effort.



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DISK SUBSCRIBERS: You can use all these programs immediately. Just follow the instructions in the accompanying magazine articles.

Antic program listings are typeset on the Star's SB-10 printer—from Star Micronics, Inc., 200 Park Avenue, New York, NY 10166.

TYPING SPECIAL ATARI CHARACTERS

Antic printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789 0123456789

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below.

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
♥	CTRL ,	●	CTRL T
	CTRL A		CTRL U
	CTRL B		CTRL V
	CTRL C		CTRL W
	CTRL D		CTRL X
	CTRL E		CTRL Y
	CTRL F		CTRL Z
	CTRL G		ESC ESC
	CTRL H	↑	ESC CTRL –
	CTRL I	↓	ESC CTRL =
	CTRL J	←	ESC CTRL +
	CTRL K	→	ESC CTRL *
	CTRL L	◆	CTRL .
	CTRL M	♠	CTRL ;
	CTRL N		SHIFT =
	CTRL O		ESC SHIFT CLEAR
♣	CTRL P	◀	ESC DELETE
	CTRL Q	▶	ESC TAB
	CTRL R		
	CTRL S		

INVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	[Atari logo] CTRL ,		[Atari logo] CTRL Y
	[Atari logo] CTRL A		[Atari logo] CTRL Z
	[Atari logo] CTRL B		ESC SHIFT DELETE
	[Atari logo] CTRL C		ESC SHIFT INSERT
	[Atari logo] CTRL D		ESC CTRL TAB
	[Atari logo] CTRL E		ESC SHIFT TAB
	[Atari logo] CTRL F		[Atari logo] CTRL .
	[Atari logo] CTRL G		[Atari logo] CTRL ;
	[Atari logo] CTRL H		[Atari logo] SHIFT =
	[Atari logo] CTRL I		ESC CTRL 2
	[Atari logo] CTRL J		ESC CTRL DELETE
	[Atari logo] CTRL K		ESC CTRL INSERT
	[Atari logo] CTRL L		
	[Atari logo] CTRL M		
	[Atari logo] CTRL N		
	[Atari logo] CTRL O		
	[Atari logo] CTRL P		
	[Atari logo] CTRL Q		
	[Atari logo] CTRL R		
	[Atari logo] CTRL S		
	[Atari logo] CTRL T		
	[Atari logo] CTRL U		
	[Atari logo] CTRL V		
	[Atari logo] CTRL W		
	[Atari logo] CTRL X		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key instead.)

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be boxed. Compare the two sets of characters below:

SPECIAL			STANDARD		
		CTRL F			/
		CTRL G			SHIFT +
		CTRL N			SHIFT -
		CTRL R			–
		CTRL S			+

HOW TO USE TYPO II

TYPO II is the improved automatic proofreading program for **Antic's** type-in BASIC listings. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at left of the line number. Press [RETURN].

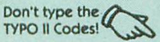
Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

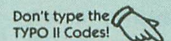
To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME" [RETURN] (Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Owners of the BASIC XL cartridge from O.S.S. type SET 5,0 and SET 12,0 before using TYPO II.




```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? "TYPO II"

EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
```




```
ET 32120 ? "↖":POSITION 11,1:? " TYPO II 
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press  RETURN  and edit line a
   bove.":GOTO 32050
```

ERROR FILE

ATARI 'TOONS

August 1985

The 22nd character in line 1090 of listing 2 is an A. Also, to load non-standard character sets, change NUMBER=1024 in line 1140 to: NUMBER=2050, and change line 1150 to: 1150 GOTO 1170.

GUESS THAT SONG

July 1985

The September, 1985 HELP! section contains an easier-reading listing of some of the tougher data lines in Guess That Song.

STAR VENTURE

July 1985

Change line 380 to:

```
380 IF PEEK(53279
)=6 THEN SOUND 0,
0,0,0:GOTO 80
```

MUSICIAN

June 1985

Change line 790 to:

```
790 IF A=54 THEN
POSITION 4,22:? #
6;"song cleared":
GOTO 810
```

And if you're having tempo problems, remove line 1720 and add the following:

```
1715 IF A=14 THEN
 TEMPO=-0.25:GOTO
 1700
1720 REM REMOVE T
HIS LINE
```

MANEUVER

April 1985

If you get hearts on the title screen, LIST the program to disk or cassette, type NEW, then ENTER and SAVE it.

FONT MAKER FOR SG-10

March 1985

The July 1985 issue of ANTIC contains a listing which, when merged with FONT MAKER, makes that program work on the Star SG-10. See the HELP section of that issue for instructions.

CUSTOM PRINT

March 1985

Custom Print has problems printing certain characters using redefined characters. Change line 5 to:

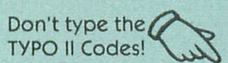
```
5 CS=PEEK(106)-8:
POKE 106,CS-1:GRA
PHICS 0:DIM CST$(
20):CST$=""
```

assembly language

BITZ

Article on page 50

LISTING 1




```
VN 10 REM BITZ
LL 20 REM BY DON LEBOW
FW 30 REM (c) 1985, ANTIC PUBLISHING
XU 100 GOTO 1400:REM SUBROUTINES AT THE T
   OP
EZ 200 REM NUMBER CONVERSIONS
ZW 300 ? C$:X=NUM:J=16:FOR I=2 TO 3:A=INT
   (X/J):HEX$(I,I)=CV$(A+1)
ND 400 X=X-J*A:J=1:NEXT I:REM HEX CONVERT

QN 500 X=USR(1581,ADR(B$),NUM):REM BINARY
    CONVERT
ZC 600 RETURN
LV 700 REM INPUT DECIMAL
IL 800 TRAP 800:? C$:POKE HP,15:? M$;:INP
   UT NUM:IF NUM>255 THEN 800:REM SINGLE
    BYTES ONLY!
UI 900 TRAP 40000:RETURN
CM 1000 REM MENU AND CHOICE
LK 1100 POKE HP,6:FOR J=0 TO 3:? J+1;" ";
   M$(J*3+1,J*3+3);"  ";:NEXT J:?
BQ 1200 POKE HP,15:? "option...";:GET #4,
   CHOICE:CHOICE=CHOICE-48:IF CHOICE<1 OR
    CHOICE>4 THEN ? C$:GOTO 1100
AF 1300 RETURN
KF 1400 REM PROGRAM STARTS
QH 1500 GRAPHICS 1:POKE 710,0:POKE 752,1:
   POKE 711,72:POKE 708,250:POKE 709,152:
   CLOSE #4:OPEN #4,4,0,"K:"
NW 1510 DLIST=PEEK(560)+256*PEEK(561):FOR
    I=0 TO 3:POKE DLIST+I+21,2:NEXT I
LL 1600 DIM OP1$(12),OP2$(12),B$(8),C$(1)
   ,M$(12):C$=CHR$(125):B$="00000000":REA
   D OP1$,OP2$
VA 1700 DATA lsraslrolror,andoraeorbit
VX 1800 DIM OP1(4),OP2(4),HEX$(3),CV$(16)
   :CV$="0123456789ABCDEF":HEX$(1,1)="$"
AO 1900 FOR I=1 TO 4:READ A,B:OP1(I)=A:OP
   2(I)=B:NEXT I
RR 2000 DATA 74,37,10,5,42,69,106,36
MR 2100 RESULT=205:FLAGS=206:FLAGOPT=207:
   OPCODE1=1555:OPCODE2=1574:BYTES=1612:H
   P=657
AE 2200 FOR J=1536 TO 1611:READ A:POKE J,
   A:NEXT J
XD 2300 DATA 104,201,2,240,22,165,207,240
   ,7,165,206,72,40,76,17,6,24,104,104,23
   4,133,205,8,104,133
QL 2400 DATA 206,96,24,104,104,133,203,10
   4,104,133,204,165,203,234,204,133,205,
   76,22,6,104,104,133,209,104
YV 2500 DATA 133,208,104,104,160,7,74,72,
   144,7,169,49,145,208,76,71,6,169,79,14
   5,208,104,136,16,237,96
BZ 2600 REM MAIN LOOP
LW 2700 POSITION 7,0:? #6;"bitz":A=PEEK(F
   LAGS):FOR J=14 TO 1 STEP -1.5:SOUND 0,
   A,10,J:NEXT J:SOUND 0,0,0,0
ZD 2800 POKE HP,11:? " bytes-> 1 or 2  ":
   GET #4,CHOICE:CHOICE=CHOICE-48:IF CHOI
   CE<1 OR CHOICE>2 THEN ? C$;:GOTO 2800
MR 2900 POKE BYTES,CHOICE:? #6;C$
GX 2910 WHICHTYPE=CHOICE
QD 3000 ON PEEK(BYTES) GOTO 3100,4300
CA 3100 REM ONE BYTE
TX 3200 ? C$:POSITION 4,2:? #6;"single by
   te":M$=OP1$:GOSUB 1000
TZ 3300 J=CHOICE-1:POSITION 8,10:? #6;OP1
   $(J*3+1,J*3+3);
QF 3400 POKE OPCODE1,OP1(CHOICE):REM POKE
    SINGLE BYTE OPCODE FROM ARRAY
LT 3500 ? C$:POKE HP,0:? " esc  OLD carry
     return  CLEAR carry";
KH 3600 GET #4,J:IF J<>27 AND J<>155 THEN
    3500
TD 3700 IF J=27 THEN POKE FLAGOPT,1:NUM=P
   EEK(FLAGS):GOSUB 200:POSITION 5,3:? #6
   ;"carry  ";B$(8,8):GOTO 3900
HB 3800 POKE FLAGOPT,0
EW 3900 M$="target ":GOSUB 700
UQ 4000 ? C$:POSITION 0,6:? #6;NUM:NUM1=N
   UM:GOSUB 200
VL 4100 POSITION 5,6:? #6;HEX$;:POSITION
   11,6:? #6;B$;
VA 4200 J=USR(1536,NUM1):GOTO 5400
SA 4300 REM TWO BYTES
OB 4400 ? C$:POSITION 4,2:? #6;"double by
   te":M$=OP2$:GOSUB 1000
QE 4500 J=CHOICE-1:POSITION 8,8:? #6;OP2$
   (J*3+1,J*3+3):POKE FLAGOPT,0
ND 4600 POKE OPCODE2,OP2(CHOICE):REM POKE
    OPCODE FROM ARRAY
FH 4700 IF WHICHTYPE=1 THEN M$="target ":
   GOSUB 700
AZ 4710 IF WHICHTYPE=2 THEN M$="mask ":GO
   SUB 700
LQ 4800 POSITION 0,6:? #6;NUM:NUM1=NUM:GO
   SUB 200
KI 4900 POSITION 5,6:? #6;HEX$;:POSITION
   11,6:? #6;B$
ZQ 5000 IF WHICHTYPE=1 THEN M$="mask ":GO
   SUB 700
FQ 5010 IF WHICHTYPE=2 THEN M$="target ":
   GOSUB 700
HX 5100 POSITION 0,10:? #6;NUM:NUM2=NUM:G
   OSUB 200
UZ 5200 POSITION 5,10:? #6;HEX$;:POSITION
    11,10:? #6;B$
FK 5300 J=USR(1536,NUM1,NUM2)
IY 5400 REM PRINT RESULTS
SH 5500 NUM=PEEK(RESULT):POSITION 0,14:?
   #6;NUM:GOSUB 200
VC 5600 POSITION 5,14:? #6;HEX$;:POSITION
    11,14:? #6;B$;
MB 5700 NUM=PEEK(FLAGS):GOSUB 200
JB 6000 IF B$(1,1)="0" THEN POSITION 10,1
   8:? #6;"negative flag clear"
NF 6010 IF B$(1,1)="1" THEN POSITION 10,1
   8:? #6;"negative flag set"
QG 6020 IF B$(7,7)="0" THEN POSITION 10,2
   0:? #6;"zero flag clear"
XE 6030 IF B$(7,7)="1" THEN POSITION 10,2
   0:? #6;"zero flag set"
UD 6040 IF B$(8,8)="0" THEN POSITION 10,2
   2:? #6;"carry flag clear"
TW 6050 IF B$(8,8)="1" THEN POSITION 10,2
   2:? #6;"carry flag set"
QA 6100 GOTO 2600
```

LISTING 2

```
10  ; BITZ, LISTING 2
20  ; BY DON LEBOW
30  ; (c) 1985, ANTIC PUBLISHING
40  ;
50          *=  $0600
60  ;
70  ;EQUATES...z page free bytes
80  ;
90  FIRST =    $CB        ;first number
0100 SECOND = $CC        ;optional mask
0110 RESULT = $CD        ;what we got
0120 FLAGS = $CE         ;status register
```

```
0130 FLAGOPT = $CF    ;user option
0140 STRING = $D0     ;string address p
ointer
0150 ;
0160 ;MODULE 1 (USR 1536....)
0170 ;The Bit Shifter
0180 ;
0190        PLA              ;Pop argument cou
nt
0200        CMP #2           ;2 means 2 parame
ters passed
0210        BEQ DOUBLE       ;so go to double
byte routine
0220 ;
0230 ;One byte routine
0240 ;
0250        LDA FLAGOPT ;carry option
0260        BEQ CLEAR   ;0 means user has
 specified 'clear carry'
0270        LDA FLAGS   ;otherwise, get t
he old status register
0280        PHA              ;push it
0290        PLP              ;pull it to curre
nt status
0300        JMP DOTARGET ;detour around t
he CLC instruction
0310 ;
0320 CLEAR
0330        CLC
0340 ;
0350 DOTARGET
0360        PLA
0370        PLA              ;target byte
0380        NOP              ;opcode poked fro
m Basic:  'accumulator' mode
0390        STA RESULT  ;save new byte
0400 ;
0410 ;Get the flags and return
0420 ;
0430 RETURN
0440        PHP              ;push Status Regi
ster
0450        PLA              ;get it back
0460        STA FLAGS        ;put it where we
can get at it
0470        RTS              ;done
0480 ;
0490 ;
0500 ;Double byte routine
0510 ;
0520 ;
0530 DOUBLE
0540        CLC              ;default clear
0550        PLA
0560        PLA
0570        STA FIRST    ;target
0580        PLA
0590        PLA
0600        STA SECOND   ;mask
0610        LDA FIRST
0620        NOP              ;opcode poked fro
m Basic:'Zero Page' mode
0630        .BYTE SECOND ;z page mask
0640        STA RESULT   ;save result
0650        JMP RETURN   ;common return
0660 ;
0670 ;
0680 ;MODULE 2 (USR 1581,ADR(B$),NUM)
0690 ;Byte to Binary String for Basic
0700 ;
0710        PLA              ;pop argument cou
nt
0720        PLA
0730        STA STRING+1 ;hi byte of stri
ng address
0740        PLA
0750        STA STRING   ;and lo
0760        PLA
0770        PLA              ;number to conver
t
0780        LDY #7           ;index string
0790 ROTATE
0800        LSR A            ;shift right to c
arry
0810        PHA              ;save current val
ue
0820        BCC ZERO         ;zero in carry fl
ag
0830 ;
0840 ;Put "1" in string
0850 ;
0860 ONE
0870        LDA #'1
0880        STA (STRING),Y
0890        JMP NEXT
0900 ;
0910 ;Put "0" in string
0920 ;
0930 ZERO
0940        LDA #'0
0950        STA (STRING),Y
0960 ;
0970 ;Next bit
0980 ;
0990 NEXT
1000        PLA              ;get the current
value back
1010        DEY              ;decrement index
1020        BPL ROTATE       ;done all 8 bits?

1030 ;
1040 ;All finished
1050 ;
1060        RTS
```

how to program a computer simulation

DIGITAL DILITHIUM DAHLIAS

Article on page 40

LISTING 1

Don't type the TYPO II Codes!

```
LK 10 REM DIGITAL DILITHIUM DAHLIAS
MJ 11 REM BY L.E. BUCHANAN
FY 12 REM (c) 1985, ANTIC PUBLISHING
YU 20 REM SET EVERYTHING UP PROPERLY.
QF 21 GRAPHICS 9
GI 22 LMARGIN=38:X=40:RMARGIN=42
EK 23 NODE=15:STUB=151:STEM=171:SKIP=151
MF 30 REM MAKE THE STEM THEN MAKE THE
         FIRST GROWTH NODE, WHICH IS
         ALWAYS A DOUBLE BRANCH.
JA 31 FOR Y=179 TO 159 STEP -1
QT 32 COLOR NODE:PLOT X,Y:GOSUB STEM
OL 33 NEXT Y
```

continued on next page

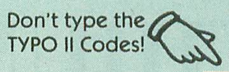
```
CX 34 COLOR NODE:PLOT 38,158:PLOT 42,158
TE 40 REM THE MAIN LOOP WHICH CREATES
          THE BRANCHES AND DRAWS THE
          STEMS AROUND THEM.
XB 41 FOR Y=158 TO 20 STEP -1
GR 42 FOR X=LMARGIN TO RMARGIN
FO 43 COLOR NODE
CJ 50 REM LOOK AT EACH POSSIBLE DOT ON
          A LINE. IF NOT A GROWTH NODE
          GO ON TO THE NEXT DOT.
QV 51 LOCATE X,Y,A:IF A<>NODE THEN GOTO S
   KIP
JB 60 REM MAKE A BRANCH ONLY 14% OF
          THE TIME.  OTHERWISE, JUMP
          PAST THE BRANCHING ROUTINE.
OW 61 IF RND(0)*100+1>14 THEN GOTO 131
OM 80 REM IF IT BRANCHES UP AGAINST AN
          ALREADY EXISTING BRANCH, DO
          AWAY WITH IT.
OE 81 LOCATE X+1,Y,B:IF B=NODE THEN GOTO
   STUB
LD 90 REM IT HAS A 60% CHANCE OF GROW-
          ING AT A 30 DEG. ANGLE OUT-
          WARD FROM THE STEM......
AE 91 CHANCE1=RND(0)*100+1
BK 92 IF X<40 AND X-3>1 AND CHANCE1>40 TH
   EN PLOT X-3,Y-1:FLAG=1:LMARGIN=LMARGIN
   -3:IF LMARGIN<1 THEN LMARGIN=1
XA 93 IF X>40 AND X+3<78 AND CHANCE1>40 T
   HEN PLOT X+3,Y-1:FLAG=1:RMARGIN=RMARGI
   N+3:IF RMARGIN>78 THEN RMARGIN=78
XT 100 REM AND A 40% CHANCE OF GROWING
           AT A 10 DEG. ANGLE BACK TO-
           WARD THE STEM.....
ZW 101 CHANCE2=RND(0)*100+1
AQ 102 IF X<40 AND X+1>1 AND CHANCE2>60 T
   HEN PLOT X+1,Y-1:FLAG=1
WV 103 IF X>40 AND X-1<78 AND CHANCE2>60
   THEN PLOT X-1,Y-1:FLAG=1
UD 110 REM AND  3% OF THE BRANCHES DID
           NOT CONTINUE TO GROW, BUT
           REMAINED STUNTED GROWTHS.
CU 111 COLOR 0:CHANCE3=RND(0)*100+1
AE 112 IF X<40 AND X-3>1 AND CHANCE3>97 T
   HEN PLOT X-3,Y-1:FLAG=1
MM 113 IF X>40 AND X+3<78 AND CHANCE3>97
   THEN PLOT X+3,Y-1:FLAG=1
PY 114 IF X<40 AND X+1>1 AND CHANCE3>97 T
   HEN PLOT X+1,Y-1:FLAG=1
MO 115 IF X>40 AND X-1<78 AND CHANCE3>97
   THEN PLOT X-1,Y-1:FLAG=1
WA 120 REM IF A BRANCH WAS MADE, SKIP
           OVER THE PART THAT DRAWS A
           STRAIGHT STEM.
EW 121 IF FLAG=1 THEN FLAG=0:GOTO 141
EC 130 REM IF THE POINT IS OFF SCREEN,
           DON'T PLOT IT.  OTHERWISE,
           DO.
YS 131 IF X<1 OR X>78 THEN GOTO SKIP
QM 132 COLOR NODE:PLOT X,Y-1
EN 140 REM JUMP TO THE SUBROUTINE THAT
           MAKES THE STEM.
VW 141 GOSUB STEM
TI 150 REM END OF THE MAIN LOOP.
LY 151 NEXT X
ML 152 NEXT Y
PJ 153 GOTO 180
CX 170 REM THIS IS THE SUBROUTINE FOR
           MAKING THE 3-D STEM AROUND
           EACH GROWTH NODE.
NC 171 C=14:FOR X1=1 TO 14:C=C-2*(179/Y):
   IF C<0 THEN X1=14:GOTO 178
ZQ 172 IF X-X1<1 THEN GOTO 175
BL 173 LOCATE X-X1,Y,B:IF B>C THEN GOTO 1
   75
CX 174 COLOR C:PLOT X-X1,Y
SA 175 IF X+X1>78 THEN GOTO 178
FK 176 LOCATE X+X1,Y,B:IF B>C THEN GOTO 1
   78
BU 177 COLOR C:PLOT X+X1,Y
HQ 178 NEXT X1
AM 179 RETURN
PW 180 REM END OF THE PROGRAM.
           PUT YOUR FAVORITE SCREEN
           DUMP ROUTINE HERE.
PV 181 GOTO 181
```

state-of-the-art Sherlock Holmes

LIE DETECTOR: BUILD YOUR OWN

Article on page 37

LISTING 1




```
WI 2 REM LIE DETECTOR
WQ 3 REM BY MICHAEL KRUEGER
FE 4 REM (c) 1985, ANTIC PUBLISHING
ZF 10 MAG=1:GOSUB 1000:S=MAG*(191/227)
CN 20 FOR X=0 TO 319:POKE 77,0:P=228-PADD
   LE(0):IF G THEN 60
PN 30 IF P<10 THEN ? "0";
IJ 40 IF P<100 THEN ? "0";
TX 50 ? P;"↑↑↑↑";
LU 60 Y=(227-P)*S:IF Y>191 THEN Y=191
AD 70 COLOR 1:PLOT X,ABS(Y(X))
FW 72 IF X<319 THEN DRAWTO X+1,ABS(Y)
FR 80 COLOR 0:X1=X+19-319*(X>299):PLOT X1
   ,ABS(Y(X1))
DW 82 DRAWTO X1+1,ABS(Y(X1+1)):COLOR 1
FZ 84 PLOT X1,L:IF PEEK(CN)<>7 THEN GOSUB
    100
MR 90 Y(X+1)=Y:NEXT X:Y(0)=Y:GOTO 20
JF 100 P=PEEK(CN):IF P<>5 THEN 140
TC 110 G= NOT (G):IF G THEN GRAPHICS 56:G
   OTO 130
HP 120 GRAPHICS 8+32
EY 130 GOSUB 500:GOTO 170
TH 140 IF P<>3 THEN 170
DP 150 COLOR 0:PLOT 0,L:DRAWTO 319,L:L=Y:
   COLOR 1:PLOT 0,L:DRAWTO 319,L
SJ 170 IF PEEK(CN)<>7 THEN 170
ZN 180 RETURN
LB 500 SETCOLOR 4,12,4:SETCOLOR 1,0,0:SET
   COLOR 2,10,8:POKE 752,1:POKE 82,0:POKE
    16,112:POKE 53774,112:RETURN
IY 1000 DIM Y(320):POKE 559,0:FOR I=0 TO
   320:Y(I)=191:NEXT I:D=1:CN=53279:L=95
PC 1020 GRAPHICS 8:GOSUB 500:COLOR 1:PLOT
    0,L:DRAWTO 319,L:? "↖  GRAPH SHOWS AP
   PROXIMATE STRESS LEVEL  ";
US 1030 ? "SUBJECT'S SKIN CONDUCTIVITY:"
UM 1040 PRINT "HIGH READINGS SHOW STRESS
   OR ACTIVITY   LOW READINGS INDICATE RE
   LAXATION↑↑←←←";:RETURN
```

starting out

NEW OWNERS' COLUMN

Article on page 48

LISTING 1

Don't type the TYPO II Codes!

```
RO 10 REM THE NEW OWNERS COLUMN
MJ 20 REM DEMO PROGRAM NUMBER ONE
PR 30 REM BY DAVID PLOTKIN
FX 40 REM (c) 1985, ANTIC PUBLISHING
JH 100 GRAPHICS 23:DEG :DIM C(3):TONE=0
NP 110 SETCOLOR 2,4,4:SETCOLOR 1,6,6
VO 120 R=45:COLOR 1:C=1
JS 130 X0=79:Y0=47
ZZ 140 FOR K=0 TO 3:C(K)=K+1*2:NEXT K
UN 150 A=15
PX 160 FOR K=1 TO 7
HX 170 X=X0+R*COS(360):Y=Y0:PLOT X,Y
AX 180 FOR I=0 TO 1.5*360 STEP A
DP 190 X=X0+R*COS(I):Y=Y0+R*SIN(I)
KF 200 DRAWTO X,Y:DRAWTO X0,Y0
SM 210 NEXT I:R=R-5:C=C+1:COLOR C
GQ 220 NEXT K
HX 230 ZZ=1
PO 240 FOR LOOP=1 TO 50
ER 250 COLOR ZZ
HL 260 XX=INT(RND(0)*159)+1
NC 270 YY=INT(RND(0)*93)+1
FQ 280 PLOT XX,YY
KH 290 ZZ=ZZ+1:IF ZZ=4 THEN ZZ=1
GX 300 NEXT LOOP:GOSUB 360
DN 310 HOLD=PEEK(708):POKE 708,PEEK(709):
   POKE 709,PEEK(710):POKE 710,HOLD
EG 320 POKE 20,0
GW 330 IF PEEK(20)<7 THEN 330
RP 340 POKE 77,0:SOUND 0,TONE,10,2:SOUND
   1,TONE+10,10,2:TONE=TONE+1:IF TONE=245
    THEN TONE=0
NK 345 GOTO 310
QZ 350 REM PRINT HELLO ON THE SCREEN.
JL 360 COLOR 1:PLOT 0,0:DRAWTO 0,16:PLOT
   10,0:DRAWTO 10,16:PLOT 0,8:DRAWTO 10,8

CO 370 COLOR 2:PLOT 0,20:DRAWTO 0,36:PLOT
    0,20:DRAWTO 10,20:PLOT 0,28:DRAWTO 10
   ,28:PLOT 0,36:DRAWTO 10,36
FV 380 COLOR 3:PLOT 0,40:DRAWTO 0,56:DRAW
   TO 10,56
NJ 390 COLOR 3:PLOT 0,60:DRAWTO 0,76:DRAW
   TO 10,76
RJ 400 COLOR 1:PLOT 0,80:DRAWTO 0,93:DRAW
   TO 10,93:DRAWTO 10,80:DRAWTO 0,80
HV 410 ZZ=1
ML 420 FOR YYY=0 TO 46:COLOR ZZ
FV 430 PLOT 145,YYY:DRAWTO 159,YYY:COLOR
   4-ZZ:PLOT 145,YYY+47:DRAWTO 159,YYY+47

JZ 440 ZZ=ZZ+1:IF ZZ=4 THEN ZZ=1
JB 450 NEXT YYY:RETURN
```

game of the month

LUNAR LANDER CONSTRUCTION SET

Article on page 73

LISTING 1

Don't type the TYPO II Codes!

```
HS 3 REM LUNAR LANDER CONSTRUCTION SET
KF 5 REM BY DANIEL DEIGHAN
OO 6 REM (c) 1985, ANTIC PUBLISHING INC.
XJ 10 GRAPHICS N0:GOTO 1030
BN 40 POSITION 0,22:? "                   ":
   GOSUB 200
HZ 45 Y=Y+DY*0.01:X=X+DX*0.07:P1$=PM$:P$(
   Y)=SH$:POKE 53248,X:IF PEEK(53252)<>N0
    THEN 230
HQ 50 POKE 77,0
GX 55 S=STICK(J):IF F<H THEN POKE 53250,H
   :H=H-1:IF H<76 THEN 820
JQ 60 IF S=14 THEN POKE 53249,X:P1$(Y+N10
   )=FLB$:SOUND N0,75,N8,N10:DY=DY-2.8:F=
   F-0.1:GOTO N40
BC 70 IF S=13 THEN POKE 53249,X:P1$(Y+N10
   )=FLT$:SOUND N0,65,N8,N10:DY=DY-0.6:F=
   F-0.04:GOTO N40
CY 80 IF S=7 THEN POKE 53249,X-N9:P1$(Y+N
   3)=FLL$:SOUND N0,30,N8,N6:DX=DX+0.5:DY
   =DY+G:F=F-0.02:GOTO N40
LJ 90 IF S=11 THEN POKE 53249,X+N9:P1$(Y+
   N3)=FLR$:SOUND N0,30,N8,N6:DX=DX-0.5:D
   Y=DY+G:F=F-0.02:GOTO N40
SZ 100 IF PEEK(PRT)=N6 THEN POKE 53248,N3
   :GOTO 860
YJ 105 IF STRIG(J)=N0 THEN POKE 77,N0
SB 110 SOUND N0,N0,N0,N0:DY=DY+G:GOTO N40

LC 120 P$=PM$:POKE 53278,N0:X=60:Y=30:DY=
   N0:DX=N0:TRAP 160:F=H:J=P-N1:POKE 5324
   8,X:P$(Y)=SH$:G=L*0.33
PI 140 POSITION 0,22:? "                  "
   :GOSUB 200
ST 145 FOR W=255 TO -65 STEP -N10:FOR I=-
   N10 TO N10 STEP N2:SOUND N0,ABS(W),N10
   ,ABS(I):NEXT I:NEXT W
BR 150 IF PEEK(53252)<>N0 THEN 860
ZB 155 GOTO N40
FC 160 SOUND N0,N0,N0,N0:IF PEEK(195)=5 T
```

continued on next page

```
   HEN GOSUB N200:? "  SHIP LEFT ORBIT";:
   FOR W=N1 TO 1000:NEXT W:? "[]"
HP 170 IF PEEK(195)=N3 THEN GOSUB N200:?
   "   YOU GOT LOST";:FOR W=N1 TO 1000:NE
   XT W:? "[]"
ZK 180 IF H<N0 THEN 850
WL 190 GOTO N120
YW 200 POSITION N0,N22:RETURN
WT 210 POSITION N0,N22:? "  []":RETURN
NH 215 GOSUB N1500:POSITION N2,N21:RETURN
OD 220 H=171:FOR W=95 TO N0 STEP -N1:POKE
    53250,H-W:SOUND N0,W,N10,N10:NEXT W:R
   ETURN
QJ 225 FOR W=N1 TO N200:NEXT W:RETURN
ZJ 230 IF PEEK(53252)=N8 AND E(P)=N0 THEN
    GOSUB N200:? "! LOSt FUEl dUMp !":GOS
   UB 220:GOSUB N210:E(P)=N1:GOTO N120
WL 235 IF PEEK(53252)=N1 AND E(P)=N1 THEN
    390
RB 240 IF PEEK(53252)>N2 OR DX>N3 OR DY>N
   21+L THEN 390
FR 250 FOR I=N0 TO N22-DY:POSITION N12,N2
   1:SC=SC+M*INT(N21+L-DY):? SC:FOR W=-N2
   00 TO N1 STEP 5
FU 260 SOUND N0,ABS(W),N10,N8:NEXT W:NEXT
    I:IF DY>N8 THEN 300
RH 270 GOSUB N200:? "       bonus fuel":GOSU
   B 225
YC 280 FOR I=N0 TO (N8-DY)*L:H=H+N1:SOUND
    N0,H,N10,N6:SOUND N1,H+15,N10,N6:IF H
   =172 THEN 300
BP 290 POKE 53250,H:GOSUB 225:NEXT I
ME 300 GOSUB N210:SOUND N1,N0,N0,N0:SOUND
    N0,N0,N0,N0:GOSUB N200:IF H<76 THEN 8
   50
EK 310 P$=PM$:IF PL=N2 THEN GOTO 370
VN 320 V=V+N1:POKE 77,N0:IF V/N2=INT(V/N2
   ) OR V=5 THEN POKE 53250,N0:ON V-N1 GO
   SUB 640,N0,740,540:POKE 53250,H
WF 350 GOTO N120
VF 370 F(P)=H:SC(P)=SC:P=P+(P=N1)-(P=N2):
   H=F(P):POKE 711,PEEK(1598+P):POKE 5325
   0,H:SC=SC(P):POSITION N12,N21
PG 380 ? SC;"      ":POKE 704,PEEK(1598+P):P
   OSITION N9,N21:? P:ON P GOTO 320,N120
ZZ 390 A=N1:W=N2:GOSUB 480:P$(Y)=E$(A,A+N
   10):GOSUB 490:GOSUB 500:W=-N2
LQ 400 A=A+11:W=W+N2:GOSUB 480:P$(Y)=E$(A
   ,A+N10):GOSUB 470:GOSUB 460
VS 410 A=A+11:W=W+N2:GOSUB 480:P$(Y)=E$(A
   ,A+N10):GOSUB 490:GOSUB 500:IF A<>67 T
   HEN 400
XJ 430 P$=PM$:SOUND N1,N0,N0,N0:POKE 704,
   PEEK(1598+P):POKE 203,150
SX 440 IF H<76 THEN 850
QZ 450 GOSUB 225:GOTO N120
JF 460 FOR I=N10 TO N2 STEP -N2:POKE 203,
   48+I:NEXT I:RETURN
CE 470 FOR I=50 TO 58:POKE 704,I:NEXT I:R
   ETURN
SB 480 SOUND N0,55,N8,14-W:SOUND N1,88,N8
   ,14-W:RETURN
DR 490 FOR I=58 TO 50 STEP -N1:POKE 704,I
   :NEXT I:RETURN
IH 500 FOR I=N2 TO N10:POKE 203,48+I:NEXT
    I:RETURN
KH 505 GOSUB 215:? "+REPLACE";:GOSUB 2500
   :FOR X=N1 TO 7:GOSUB N1500
RO 515 POSITION N2,19:? Y+X*N2;" ";CHR$
   (34);:FOR W=N1 TO 103:? CHR$(PEEK(SCR)
   +32);:SCR=SCR+N1:NEXT W
UC 520 ? CHR$(34);";":POSITION N2,N22:? "
   CONT";:POKE 842,13:POSITION N2,17:STOP
TD 525 NEXT X:POKE 842,N12:GOSUB N1500:GO
   SUB N200:? " save screen?(y/n)":GOSUB
   2200:IF W=78 THEN 1210
YL 530 GOSUB 2000:TRAP 535:LIST L$,Y+N2,Y
   +14:GOTO 1210
RE 535 ? "[]":GOSUB 215:? "▸▸I/O ERROR!▸▸
    try again?(y/n)":GOSUB 2200:IF W=89
   THEN 530
LT 537 GOTO 1210
NF 540 POKE 710,58:POKE 709,130:POKE 82,N
   0:? "[]";:M=N6:V=N0
HF 542 ? "
      2
     X!                               ";
QO 544 ? "                         X!!
                                    W!!!
                                      ^!!!       ";
SM 546 ? "                    1U
   !!!                                 H!Z
    ^!!!                               W!!       ";
NS 548 ? "            H!!!                       H
   !!Z                 X!!!!
    !!!Z              ^!!!! 2U                ";
ZA 550 ? "        W!!!I                  V!!!!X!!
   FU            2U     W!!!!R             V!!!!!!
   !!!Z             X!Z    H!!!!!I            XH";
NC 552 ? "!!!!!!!!O           X!!S   W!!!!!!!Z
        W!!!!!!!!!!I             H!!!U   X!!!!!!
   !R          ^!!!!!!!!!!!!!I             X!!!!Z  H";
AU 554 ? "!!!!!!!!S          X!!!!!!!!!!!I    H
   !!!!!I X!!!!!!!!!F             H!!!!!!!!!!!!6
   !!!!!!!!!6!!!!!!!!!!!!!!#$%&'!!!!!!!!!!!  ";
OU 600 ? "!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!(,,,,,),*,*,*,*,*,*,*,*,*,*,*,*,*
   *,*,*,-,,,,,,,,";
HT 610 POSITION N3,N21:? "SCORE ";P;": ";
   SC:POSITION 20,N21:? "HIGH SCORE: ";HS
   C:RETURN
QT 640 M=N21:? "[]";
OJ 642 ? "                  !!!!!!!!!!!!!!!!!!
   !!!!!!!!                   H!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!                   !!!!!!!!!!!!";
FH 644 ? "!!!!!!!!!!!!!Y P!                V!!!
   !!!!!!!!!!!!!!!!!!!!!!Y          P         H!!
   !!!!!!!!!!!<\::K!!!!!!!\      W          ";
LP 646 ? "   B!!!!!!!!!!!!!<               :;!!!!Z
      V              K=MM=M=MM<MY:             _?!!Z
           H                                  ";
HS 648 ? "    :;           W
          213U                ^
            X!!!!G              V          184D4C";
BA 650 ? "4D48          V!!!!!!I              P
      H!!!!!!!!!!S          2V!!!!!!!!            W
         X!!!!!!!!!!!I192V!!!!!!!!!!Z          ";
MJ 652 ? "       V       H!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!U            ^   H!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!EU             H V!!!!!!!!!!!!!!!!!!";
WH 654 ? "!!!!!!!!!!!!!!E                HX!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!I         H!H!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!#$%&'!!  ";
KO 656 GOSUB 600:RETURN
RB 740 M=N40:? "[]";
VC 742 ? "         ]!!!!!!!!!!!!!!!!!!!!!!!!!!!!L
   !L!L!!!!!               ]!!!!!!!!!!!!!!!!!!!!!!>A
                 ;K!!              ]!!!!!!!!!!!!!!!!!!";
HK 744 ? "!YA                  ;!                !!!!!!
   !!!!!!!!!!R                        ^              !!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
   !!!!!!!!!!!![       119              V                ";
KT 746 ? "      !!!!!!!!!!!!!!!Q         W'!!I
      H            H!!!!!!!!!!!!!!!I             ;=!!I
        V!                !!!!!!!!!!!!!!!!G                ";
FH 748 ? " P!!S      W!!               V!!!!!!!!!!!!
   !!!!69        ]!#$%&'!!             H!!!!!!!!!!!!
   !!!!!!!S          ]!!!!!!!              V!!!!!!!";
VK 750 ? "!!>>=!!!!!!!!!!G              ;L!!!!!
     W!!!!!!NOA       :JL!!!!!!!S             !!!!!
         P!!!?O                    :P!!!@A              H";
KM 752 ? "!!!!!                A                   :;Y
          3!!!!!!                                2357G
             C!!!!!!!                            V#!!'";
BD 754 ? "EG                        H!!!!!!!!!
     3C!!!!!!!!!F9          2CC!!!!!!!!!!!0U9    29
   1BV!!!!!!!!!!!!!T9 21C!!!!!!!!!!!!!!!!!  ";
KO 765 GOSUB 600:RETURN
LL 820 SOUND N0,N0,N0,N0:GOSUB N200:? "
    OUT OF FUEL"
HO 830 Y=Y+DY*6.0E-03:X=X+DX*0.05:P1$=PM$
   :P$(Y)=SH$:POKE 53248,X:DY=DY+G:IF PEE
   K(53252)>N0 THEN 230
PU 840 GOTO 830
XD 850 SOUND N0,N0,N0,N0:IF PL=N2 THEN PL
   =N1:GOTO 370
OZ 860 SC(P)=SC:FOR W=N0 TO N10:FOR I=80
   TO 94:POKE 203,I:POKE 712,I:NEXT I:SOU
   ND N0,W*N8,N0,N10:NEXT W
NS 870 FOR P=N1 TO N2:IF SC(P)>HSC THEN H
   SC=SC(P)
GI 880 NEXT P:POSITION 32,N21:? HSC:P=N1:
   POKE 203,150:POKE 712,N0:SOUND N0,N0,N
   0,N0:J=N1:POKE 711,142:A=N0
TK 890 IF STRIG(N0)=N0 THEN 940
GB 900 POSITION N0,N22:? RE$(J,J+19):J=J+
```

```
   N1:IF J=242 THEN J=N1
FN 910 POSITION N12,N21:? "          ":ON PE
   EK(PRT) GOTO 3000,920,1000,920,960,940
SC 915 IF PEEK(764)=157 THEN STOP
WV 920 A=A+N1:IF A=N10 THEN P=P+(P=N1)-(P
   =N2):POSITION N9,N21:? P:A=N0
KP 930 POSITION N12,N21:? SC(P):W=N1^N1:G
   OTO 890
BB 940 POKE 77,N0:GOSUB N210:POSITION N12
   ,N21:? "          ":SC=N0:IF V>N1 THEN G
   OSUB 540
AX 945 POSITION N9,N21:? N1:E(N1)=N0:E(N2
   )=N0:V=N0:PL=PN
KT 950 SC(N2)=N0:F(N2)=171:POKE 704,N200:
   POKE 711,N200:GOSUB 220:P=N1:GOTO N120
OC 960 GOSUB N210:POSITION N2,N22:? "GRAV
   ITY LEVEL: ";L;"  DESTINATION-";L$;
JZ 970 IF PEEK(PRT)=N6 OR PEEK(PRT)=N3 TH
   EN GOSUB N210:GOTO 890
VA 980 IF PEEK(PRT)=5 THEN L=L+N1:IF L=N1
   0 THEN L=N1
EI 990 RESTORE 5000:FOR A=N1 TO L:READ L$
   :NEXT A:POSITION 32,N22:? L$;:POSITION
    17,N22:? L;:GOTO 970
FT 1000 GOSUB N200:? "      ";PL;" PLAYER
     ":IF PEEK(PRT)=N3 THEN PL=PL+N1:
   IF PL=N3 THEN PL=N1
BH 1010 IF PEEK(PRT)=5 OR PEEK(PRT)=N6 TH
   EN PN=PL:POSITION N1,N21:? PL:GOTO 890
MU 1020 GOTO 1000
YQ 1030 READ N1,N2,N3,N6,N8,N9,N10,N12,N2
   1,N22,N40,N120,N128,N200,N210,N1500,PR
   T:V=N0:L=N3:P=N1:OPEN #N1,4,N0,"K"
KW 1035 DATA 1,2,3,6,8,9,10,12,21,22,40,1
   20,128,200,210,1500,53279
IS 1040 DIM D$(N1),F$((INT(ADR(D$)/1024)+
   N1)*1024-ADR(D$)-N1),SH$(13),FLB$(N9),
   FLL$(N3),FLR$(N3),FLT$(4),GAS$(N10)
XX 1050 SH$="♥♥<B▣B<▣▣▣▣♥♥":FLB$="<◀▣◀<<
   ▣":FLL$="▣+▣":FLR$="◆▣◆":FLT$="<<<▣":
   GAS$="<▣▣▣▣▣▣▣▣<"
JR 1100 DIM E$(77),L$(15),RE$(378),P$(N12
   8),P1$(N128),P2$(N128),PM$(N128),CHSET
   $(512),SC(N2),F(N2),E(N2)
OR 1110 E$="♥<B▣▣▣▣▣▣B♥♥♥<BfB◀◀<♥♥♥♥♥♥▣$<
   ▣♥♥♥♥♥♥♥▣♥♥♥♥♥♥♥♥▣$$▣♥♥♥♥♥♥<BBBB<♥♥♥
   ♥<BCCCCB<♥"
EL 1120 PM$=CHR$(N0):PM$(N128)=CHR$(N0):P
   M$(N2)=PM$:P$=PM$:P1$=PM$:P2$=PM$
JO 1125 DL=PEEK(560)+256*PEEK(561)+4:FOR
   I=N2 TO 19:POKE DL+I,4:NEXT I:POKE DL-
   N1,68:POKE DL+20,132:POKE DL+23,N6
ES 1130 CHSET$="♥♥♥♥♥♥♥♥▣▣▣▣▣▣▣▣♥♥♥♥♥♥♥♥▣
   ▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣
   ▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣"
DD 1132 CHSET$(97)="▣▣▣▣▣▣▣▣▣▣▣▣▣▣?////
   ///♥<▣▣▣▣▣▣♥♥♥<▣▣▣▣"
JJ 1134 CHSET$(137)="♥♥♥♥♥<▣▣♥♥♥♥♥▣?▣♥♥♥▣
   ?▣▣▣♥♥?▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣♥♥▣▣▣▣▣▣♥♥
   ♥▣▣▣▣▣♥♥♥♥♥▣▣▣▣?▣♥♥♥♥♥▣▣▣?▣♥♥♥▣▣▣▣▣?"
UX 1136 CHSET$(231)="♥♥▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣
   ▣▣▣▣♥♥▣▣▣▣▣▣♥♥♥▣▣▣♥♥♥♥♥♥♥♥▣▣??▣♥▣?▣▣▣▣▣
   ▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣♥▣▣▣▣▣▣▣♥♥♥▣▣▣▣▣▣▣?"
QL 1138 CHSET$(325)="??▣▣▣▣▣▣▣▣▣▣??▣♥♥♥
   ▣▣▣▣▣?▣♥▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣♥
   ♥♥▣▣??▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣♥♥"
ZH 1140 CHSET$(419)="▣▣▣▣▣▣♥♥♥♥▣▣▣▣▣▣▣▣▣▣
   ??▣▣▣▣▣▣▣♥♥♥▣▣▣▣?▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣
   ▣▣♥▣▣▣▣♥♥♥♥??▣▣▣▣▣▣▣▣▣▣▣▣?▣▣▣▣♥♥♥"
AH 1160 FOR I=N0 TO 64:READ A:POKE 1536+I
   ,A:NEXT I:A=USR(1588):POKE 512,N21:POK
   E 513,N6:POKE 54286,192
LT 1170 DATA 165,20,69,79,37,78,141,22,20
   8,165,203,69,79,37,78,141,24,208,76,98
   ,228,72,173,196,2,69,79,37,78,141,22
ZQ 1180 DATA 208,173,198,2,69,79,37,78,14
   1,10,212,141,24,208,169,224,141,9,212,
   104,64,104,162,6,160,0,169,7,32
KF 1185 DATA 92,228,96,200,70
VQ 1190 POKE 756,ADR(CHSET$)/256:POKE 542
   79,ADR(SH$)/256:POKE 203,150
EK 1210 POKE 16,112:POKE 53774,112:POKE 5
   59,46:POKE 53277,N2:POKE 623,N1:POKE 2
   0,N0:POKE 752,N1:SC(N1)=N0:SC(N2)=N0
VA 1215 POKE 842,N12:PL=N1:POKE 711,142:P
   OKE 704,N200:POKE 705,78:J=N1:GOSUB 54
   0:P2$(90)=GAS$:L$="THE MOON"
AC 1217 GOSUB 5010
VM 1219 GOTO 890
VI 1500 POSITION N2,18:? "▣▣▣▣▣▣":RETURN
SW 2000 TRAP 2000:GOSUB 215:? "FILESPEC (
   DEV:FILENAME.EXT)":INPUT L$:RETURN
OY 2200 GET #N1,W:IF W<>78 AND W<>89 THEN
    2200
AH 2210 RETURN
KA 2500 ? " WHAT SCREEN? 1-2-3 (ESC=ABORT
   ) enter selection"
QW 2510 GET #N1,W:IF W<>49 AND W<>50 AND
   W<>51 AND W<>27 THEN 2510
DX 2520 IF W<>27 THEN Y=540+100*(W-49):RE
   TURN
PH 2530 GOSUB 215:? "↓ abort?(y/n)":GET #
   N1,G:IF G=89 THEN POP :GOTO 1210
QR 2540 GOTO 2510
EM 3000 GOSUB 215:? "↑1 ALTER SCREEN, OR
   2 CREATE NEW SCREEN enter selection"
YE 3010 GET #N1,W:IF W<>49 AND W<>50 THEN
    3010
WS 3020 IF W=50 THEN GOTO 4000
BI 3030 GOSUB 215:? " ALTER";:GOSUB 2500:
   GOSUB Y
GT 3060 POKE 53250,N0:GOSUB N1500:RE$=" "
   :RE$(N128)=" ":RE$(N2)=RE$
YE 3070 RE$(N21)=" !%":FOR W=24 TO 72:RE$
   (W,W)=CHR$(W+23):NEXT W:RE$(N128)="♥"
YW 3500 X=N8:SCR=PEEK(88)+256*PEEK(89):GO
   SUB 215:? "▶     USE JOYSTICK TO▶▶    s
   elect figure"
NG 3510 POSITION N6,19:? RE$(X,X+25);:W=P
   EEK(SCR+779)+N128:POKE SCR+739,W
QY 3520 X=X+(STICK(N0)=7)-(STICK(N0)=11):
   X=X-(X=60)+(X=7)
HM 3560 IF STRIG(N0)=N1 THEN 3510
KH 3570 X=N3:Y=N3:GOSUB 215:? "+<ESC>DONE
    <SELECT>FIGURE <OPTION>ABORT design l
   anding site"
DI 3700 A=SCR+Y*N40+X:J=PEEK(A):POKE A,W:
   A=A*A/A:POKE A,J:IF STRIG(N0)=N0 THEN
   POKE A,W-N128:POKE 77,N0
ZG 3710 IF STRIG(N0)=N0 AND W=133 THEN W=
   N3:FOR G=A-N2 TO A+N2:POKE G,W:W=W+N1:
   NEXT G:W=133
HT 3720 X=X+(STICK(N0)=7)-(STICK(N0)=11):
   X=X-(X=N40)*N40+(X=-N1)*N40
YY 3730 Y=Y+(STICK(N0)=13)-(STICK(N0)=14)
   :Y=Y-(Y=18)*18+(Y=-N1)*18
QQ 3740 IF PEEK(PRT)=5 THEN GOTO 3500
DC 3750 IF PEEK(764)=28 THEN POKE 764,255
   :GOTO 505
LV 3760 IF PEEK(PRT)=N3 THEN GOSUB 215:?
   "↓ abort?(y/n)":GET #N1,G:IF G=89 THEN
    GOSUB N1500:GOTO 3000
SB 3770 GOTO 3700
XF 4000 GOSUB N210:? "load a screen?(y/n)
   ":GOSUB 2200:IF W=78 THEN ? "↖":GOTO 3
   060
XZ 4010 GOSUB 2000:TRAP 4030:GOSUB N1500:
   POSITION N2,N22:? "RUN";:POKE 842,13:P
   OSITION N2,17:ENTER L$
SZ 4030 POKE 842,N12:? "↖":POSITION N2,N2
   1:? "I/O ERROR!":GOTO 4000
HK 5000 DATA PHOBOS    ,EUROPA    ,THE MOON,I
   O         ,TITAN,GANYMEDE,MERCURY  ,MARS
     ,EARTH
BS 5010 RE$(1,87)="      game over      PRE
   SS <start> TO REPLAY     lander constru
   ction set       BY daniel d"
QA 5020 RE$(88,174)="eighan        <option>
   -NUMBER OF PLAYERS ... <select>-GRAVIT
   Y LEVEL ... <option><select>-"
TN 5030 RE$(175,261)="DESIGN LANDING SITE
        LAND ON THE PAD AS softly as pos
   sible!!           game over         "
AP 5040 RETURN
```

LISTING 2

```
ZD 10 REM LUNAR LANDER CONSTRUCTION SET
QC 15 REM CREATES LINES 1130-1140
```

continued on next page

```
RA 20 REM BY DANIEL DEIGHAN
FW 30 REM (c) 1985, ANTIC PUBLISHING
CQ 40 REM (LINES 10-220 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IS 45 REM CHANGE LINE 70 AS NECESSARY.)
MG 50 DIM FN$(20),TEMP$(20),AR$(93)
HO 60 DPL=PEEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
YS 80 GRAPHICS 0:? "      ANTIC'S GENERIC
   BASIC LOADER"
CD 90 ? ,"BY CHARLES JACKSON"
PW 100 POKE 10592,DPL:TRAP 170
PO 110 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LQ 120 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BK 130 AR$="":READ AR$
XW 140 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DG 150 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
UY 160 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 130
MZ 170 IF PEEK(195)=5 THEN ? :? :? "TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CZ 180 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
AL 200 OPEN #1,8,0,FN$
PP 210 POKE 766,1:? #1;A$;:POKE 766,0
AF 220 CLOSE #1:GRAPHICS 0:? " COMPLETED 
   "
JL 1000 DATA 626
YJ 1010 DATA 0490490510480320670720830690
   84036061034000000000000000000000000255
   255255255255255255255000000
XJ 1020 DATA 00000000000000000002492502542
   55255255255255170170170239190251255255
   170170170170235255255255170
BI 1030 DATA 1701702511902392552551111751
   91255255255255255255254250250250250250
   254170255234254234234255170
GQ 1040 DATA 1702542542552552542541701702
   54255255255255254170034155049049051050
   032067072083069084036040057
JB 1050 DATA 0550410610341701701701701701
   70170170170255234254234234234170191175
   175175175175175191000060255
BH 1060 DATA 2552552552552550000000000602
   55255255255034155049049051052032067072
   083069084036040049051055041
VJ 1070 DATA 0610340000000000000000602552
   55000000000000000000306325500000000003
   063255255255000000063255255
GG 1080 DATA 2552552550032552552552552552
   55255192255255255255255255255000000252
   255255255255255000000000192
SW 1090 DATA 2522552552550000000000000001
   92252255255063003000000000000000255255
   255063003000000000255255255
ON 1100 DATA 2552550630341550490490510540
   32067072083069084036040050051049041061
   034000000255255255255255255
ZX 1110 DATA 2550032552552552552552552551
   92255255255255255252000000255255255252
   192000000000255252192000000
GG 1120 DATA 0000000000000000000030150630
   63255000003063255255255255255015255255
   255255255255255240255255255
WS 1130 DATA 2552552552550001922522552552
   55255255000000000192240252252255003015
   015063034155049049051056032
NQ 1140 DATA 0670720830690840360400510500
   53041061034063063255255192240240252252
   252255255255063063015003000
IY 1150 DATA 0000002552552552552550630030
   00255255255255255255255015255255255255
   255255255240255255255255255
LG 1160 DATA 2521920002552522522401920000
   00000255255063063063015015003255255252
   252252240240192192192240240
HN 1170 DATA 2402402522521921921921922402
   40240240000000034155049049052048032067
   072083069084036040052049057
FM 1180 DATA 0410610341921922402402522520
   00000000000192240240252003003015015015
   015063063003003003003015015
KS 1190 DATA 0150150000000000000030030150150
   63252252252240240240192192240240240240
   192192192192252252240240192
XD 1200 DATA 1920000002522402401920000000
   00000063063015015015015003003015015015
   015003003003003063015015003
GM 1210 DATA 003000000000034155
```

st section

MIDI DRIVER

Article on page 54

LISTING 1

```
/*
 *  A Monophonic MIDI driver for ALCYON -or- HIPPO-C.
 *  (c) 1985 Antic Publishing
 *  Version 111885
 *  Written by Tom Jeffries
 *  Re-edited and XBIOS calls by Patrick Bass
 */

/*--- Include this file for ALCYON C only! ------------------------*/
#include      "osbind.h"

/*--- MIDI constants ------------------------------------------------*/
#define       MODE2      0xb0,0x7d,0x00,0x7e,0x00    /* omni on; mono   */
#define       NOTEON   0x90
```

```
#define         NOTEOFF 0x80
#define         CHANNEL1 0x00
#define         FULLVELOCITY 64
#define         NOVELOCITY 0
#define         NUMBER_NOTES 100
#define         TEMPO   500
#define         TRUE    1
#define         FALSE   0

/*----- Globals ---------------------------------------------------------*/
char    Midistring[]={ MODE2 };

char    notestring[ NUMBER_NOTES ],
        restlength[ NUMBER_NOTES ],
        notelength[ NUMBER_NOTES ],
        musicstring[]={'g',5,24,24,
                       'd',5,16,0,
                       'c','#',5,16,0,
                       'd',5,16,0,
                       'd','#',5,48,0,
                       'd',5,48,48,
                       'f','#',5,24,24,
                       'g',5,24,24,
                       'x' };

int     end=0, merror=0, h, i, j, note;

/*----- Include this External reference for HIPPO-C only! ------------
extern  Midiws();
*/

/*----- Program Body ----------------------------------------------------*/
main()
{

        merror=FALSE;
        for(i=0, j=0, h=0; (musicstring[ j ] != 'x'); i++, j++, h++){
                switch( musicstring[ j ] ){

                        case 'a':
                                note= (-3); break;

                        case 'b':
                                note= (-1); break;

                        case 'c':
                                note= 0; break;

                        case 'd':
                                note= 2; break;

                        case 'e':
                                note= 4; break;

                        case 'f':
                                note= 5; break;

                        case 'g':
                                note= 7; break;

                        default:
                                printf( "Incorrect note name.\n" );
                                merror= TRUE;
                }

                if ( musicstring[ ++j ]=='#'){
                        note++;
                        j++;
                }
```

continued on next page

```
        notestring[ i ]=(( musicstring[ j++ ]*12 )+note );
        notelength[ h ]=musicstring[ j++ ];
        restlength[ h ]=musicstring[ j ];

}

/*mark end of song*/
notestring[ ++i ]=0;

if( !merror ){

        Midiws( 4, midistring );

        midistring[ 0 ]=CHANNEL1+NOTEON;
        for( i=0; notestring[ i ] !=0; i++ ){

                printf( "%d\n", notestring[ i ] );
                Midistring[ 1 ]= notestring[ i ];
                Midistring[ 2 ]= FULLVELOCITY;

                Midiws( 2, midistring );

                for( j=0; j<=notelength[ i ]; j++ ){
                        for( h=0; h<=TEMPO; h++ );
                }

                midistring[ 2 ]=NOVELOCITY;

                Midiws( 2, midistring );
                        for( j=0; j<=restlength[ i ]; j++ ){
                                for( h=0; h<=TEMPO; h++ );
                        }
                }
                midistring[ 0 ]=NOTEOFF;
                midistring[ 2 ]=FULLVELOCITY;

                Midiws( 2, midistring );
        }

}
```

LISTING 2

```
;----- Midiws() XBIOS call for midi.c -----------------------------------
; Written by Patrick Bass
; Version 111885
; (c) 1985 Antic Publishing
;
    .text

    .global    _Midiws

;-----------------------------------------------------------------------
_Midiws:
        link    a6,#-8
        move.l  12(a6),(SP)      ;pointer to string
        move.w  10(a6),-(SP)     ;count-1
        move.w  #12,-(SP)        ;opcode number
        trap    #14
        unlk    a6
        rts

        .even
```

st section

HIPPOSOUND

Article on page 59

LISTING 1

```
/*
 * HIPPOSOUND v 112185
 * A Demo Sound Driver for Haba HIPPO-C
 * C and XBIOS source written by Patrick Bass
 * (c) 1985 Antic Publishing
 *
 * This program demonstrates the usage of the
 * "Giaccess()" and "Random()" XBIOS bindings for Haba HIPPO-C.
 *
 */

/*----- Global Variables/Constants Declarations ------------------------*/

char    copyright[]="(c)1985 Antic Publishing";

int     contrl[12],
        intin[256], intout[256],
        ptsin[256], ptsout[256],
        workin[20], workout[100],
        handle, i, j,
        port_state,
        x_note, y_note,
        write_command=128, read_command=0,
        volume=9,
        chana_lo=0, chana_hi=1,
        chan_enable=7,
        chana_vol=8;

/*----- External Communications -----------------------------------------*/
extern  Giaccess(),
        Random();

/*----- Program Body ------------------------------------------------------*/
main()
{
     appl_init();
     handle=graf_handle( &i, &i, &i, &i );

     for( i=0; i<10; workin[ i++ ]=1 );  workin[ 10 ]=2;
     v_opnvwk( workin, &handle, workout );

     Giaccess( volume, chana_vol+write_command );
     port_state=Giaccess( i, chan_enable+read_command );
     Giaccess( 60, chan_enable+write_command );

     for( i=0; i<100; i++ ){

          x_note=Random()&0x00ff;
          y_note=Random()&0x000f;

          Giaccess( x_note, chana_lo+write_command );
          Giaccess( y_note, chana_hi+write_command );

          for( j=0; j<5000; j++ );
     }

     Giaccess( 0, chana_vol+write_command );
```

continued on next page

```
    Giaccess( port_state, chan_enable+write_command );

    v_clsvwk( handle );
    appl_exit();
}
```

LISTING 2

```
;   File: HXBIOS.S
;   Atari 520ST XBIOS bindings for Haba HIPPO-C Sound demo.
;   (c) 1985 Antic Publishing
;   Written by Patrick Bass
;
    .text

;---- Global Communications Section ---------------------------------------

    .global _Random
    .global _Giaccess

;---- XBIOS 17: Return Random Number -------------------------------------
; This call will return a random 24-bit number in register d0.
; C binding:  return_value=Random();

_Random:
        link    a6,#-2
        move.w  #17,(SP)
        trap    #14
        unlk    a6
        rts

;---- XBIOS 28: Access GI sound chip -------------------------------------
; This call will pass and recieve values to the AY-3-8910 sound chip.
; C binding:  return_value=Giaccess( data, register );
; Add 128 decimal to register number to WRITE data into register.
; Add 000 decimal to register number to READ register into return_value.
_Giaccess:
        link    a6,#-12
        move.w  14(a6),(SP)
        move.w  10(a6),-(SP)
        move.w  #28,-(SP)
        trap    #14
        unlk    a6
        rts
```

---

st section

ST LOGO MODERNE

Article on page 61

LISTING 1

```
TO MODERNE
 CANVAS
 CLEARSCREEN
 HIDETURTLE
 REPEAT 5 [OBJECTS]
END
```

```
TO OBJECTS
 POLYGONS
 BOXES
 LINES
 CIRCLES
 ELLIPSES
```

```
END

TO POLYGONS
 LINETYPE
 MAKE "LIST1 []
LABEL "POLYLOOP
 MAKE "NUMOFSIDES RANDOM 9
 IF (:NUMOFSIDES < 3)
    [GO "POLYLOOP]
 COORDINATES
 MAKE "STARTX :X
 MAKE "STARTY :Y
 MAKE "NUMOFSIDES :NUMOFSIDES - 2
 REPEAT :NUMOFSIDES [COORDINATES]
 MAKE "LIST1 LPUT :STARTX :LIST1
 MAKE "LIST1 LPUT :STARTY :LIST1
 FILLORNOT
 POLY :LIST1
END

TO BOXES
 LINETYPE
 MAKE "LIST1 []
 COORDINATES
 MAKE "WIDTH RANDOM 25
 MAKE "HEIGHT RANDOM 25
 MAKE "LIST1 LPUT :WIDTH :LIST1
 MAKE "LIST1 LPUT :HEIGHT :LIST1
 FILLORNOT
 BOX :LIST1
END

TO LINES
 LINETYPE
 MAKE "LIST1 []
 REPEAT 2 [COORDINATES]
 POLY :LIST1
END

TO CIRCLES
 LINETYPE
 MAKE "LIST1 []
 COORDINATES
 MAKE "RADIUS RANDOM 25
 MAKE "LIST1 LPUT :RADIUS :LIST1
 FILLORNOT
 CIRCLE :LIST1
END

TO ELLIPSES
 LINETYPE
 MAKE "LIST1 []
 COORDINATES
 MAKE "XRADIUS RANDOM 25
 MAKE "YRADIUS RANDOM 25
 MAKE "LIST1 LPUT :XRADIUS :LIST1
 MAKE "LIST1 LPUT :YRADIUS :LIST1
 FILLORNOT
 ELLIPSE :LIST1
END

TO COORDINATES
 MAKE "X RANDOM 154
 ONEORTHEOTHER
 MAKE "X (:X * :Z)
 MAKE "Y RANDOM 92
 ONEORTHEOTHER
 MAKE "Y (:Y * :Z)
 MAKE "LIST1 LPUT :X :LIST1
 MAKE "LIST1 LPUT :Y :LIST1
END

TO LINETYPE
 MAKE "WIDTH RANDOM 20
 MAKE "COLOR RANDOM 16
 MAKE "LIST1 [1]
 MAKE "LIST1 LPUT :WIDTH :LIST1
 MAKE "LIST1 LPUT :COLOR :LIST1
 SETLINE :LIST1
END

TO ONEORTHEOTHER
 MAKE "Z RANDOM 2
 IF (:Z = 1)
    [MAKE "Z 1]
    [MAKE "Z -1]
END

TO FILLORNOT
 ONEORTHEOTHER
 IF (:Z = 1)
    [MAKE "GFILL "TRUE HOWTOFILL]
    [MAKE "GFILL "FALSE]
END

TO HOWTOFILL
 MAKE "STYLE RANDOM 4
 IF (:STYLE < 2)
    [MAKE "INDEX 0]
 IF (:STYLE = 2)
    [MAKE "INDEX RANDOM 25]
 IF (:STYLE = 3)
    [MAKE "INDEX RANDOM 13]
 MAKE "COLOR RANDOM 16
 MAKE "LIST2 []
 MAKE "LIST2 LPUT :STYLE :LIST2
 MAKE "LIST2 LPUT :INDEX :LIST2
 MAKE "LIST2 LPUT :COLOR :LIST2
 SETFILL :LIST2
END

TO CANVAS
 SETBG RANDOM 16
END
```

continued on next page

joystick-controlled word processor

STICKWRITER

Article on page 45

LISTING 1

Don't type the TYPO II Codes!

```
EX 10 REM STICK WRITER
WJ 20 REM BY BILL LUKEROTH
FW 30 REM (c) 1985, ANTIC PUBLISHING
VX 40 GOSUB 1030:REM SET UP PROGRAM
OM 50 GOTO 170
AE 60 STOP
WO 70 POKE 752,1:RETURN :REM CURSOR OFF
NY 80 POKE 752,0:RETURN :REM CURSOR ON
AN 90 POKE 16,112:POKE 53774,112:RETURN : REM DISABLE BREAK KEY
IW 100 POSITION 2,19:FOR L=1 TO 189:? " ";:NEXT L:RETURN :REM CLEAR SCREEN
CX 110 IF LEN(MAIN$)<=1 THEN 130
BM 120 MAIN$=MAIN$(1,LEN(MAIN$)-1)
ZD 130 RETURN
OX 140 IF LEN(TEMP$)<=1 THEN 160
DH 150 TEMP$=TEMP$(1,LEN(TEMP$)-1)
ZJ 160 RETURN
AR 170 GRAPHICS 0:GOSUB 90:OPEN #1,4,0,"K:"
EP 180 GOSUB 70:POKE 709,PEEK(710):REM TURN OFF CURSOR, SET CHARACTER COLOR TO BACKGROUND COLOR
EU 190 FOR L=1 TO 6:READ COL:ARY(L)=COL:NEXT L:REM PRINT WORD SCREEN
PF 200 FOR L=1 TO 6
PM 210 FOR L2=0 TO 11:READ WORD$:POSITION ARY(L),L2:? WORD$:NEXT L2
HA 220 NEXT L
ZR 230 FOR L=65 TO 82:? CHR$(L);" ";:NEXT L:?
NS 240 FOR L=83 TO 90:? CHR$(L);" ";:NEXT L
BW 250 FOR L=48 TO 57:? CHR$(L);" ";:NEXT L:?
QG 260 FOR L=1 TO 18:? PUNC$(L,L);" ";:NEXT L:?
HK 270 ? "CLEAR SCREEN  BACKSPACE    PRINT"
HK 280 ? "ERASE MEMORY  DELETE WORD  RING BELL"
RK 290 ? "VOICE                QUIT"
DM 300 FOR L=1 TO 38:? "-";:NEXT L
SG 310 ? "DIRECTIONS:use the joystick to move   the cursor to the desired word, then   press the joystick button."
QX 320 ? "TO START:press the joystick button."
WP 330 POKE 709,154:REM MAKE CHARACTERS VISIBLE
YE 340 IF STRIG(0)=1 THEN 340
EB 350 WORD=0
XR 360 CLOSE #2:GOSUB 100:TEMP$="":FLAG1=0
SY 370 POSITION 19,5:GOSUB 80:? " ";:REM JOYSTICK ROUTINE
RK 380 OLDWORD=WORD:WORD=0:PAUSE=0:IF FLAG1=1 THEN 410
LU 390 IF LEN(MAIN$)<4000-200 THEN 410
DE 400 POKE 710,48:POSITION 2,18:? "MEMORY CRITICAL.ERASE,PRINT OR QUIT. ":POSITION 19,5:? " ";:FLAG1=1
VQ 410 MOVE=STICK(0):POKE 77,0:REM DISABLE ATTRACT MODE
BN 420 IF MOVE=15 THEN 540
XD 430 IF INT(MOVE/2)<>MOVE/2 THEN 470
HH 440 IF PEEK(84)=0 THEN POKE 84,18
KH 450 ? "↑";
NJ 460 GOTO 500
LH 470 IF MOVE=11 OR MOVE=7 THEN 500
ZY 480 IF PEEK(84)=17 THEN POKE 84,23
KX 490 ? "↓";
NM 500 IF MOVE>8 AND MOVE<12 THEN ? "←";
ZL 510 IF MOVE>4 AND MOVE<8 THEN ? "→";
KB 520 PAUSE=PAUSE+1:IF PAUSE>16 THEN PAUSE=16
MW 530 FOR L=0 TO PAUSE:NEXT L:REM SLOW DOWN CURSOR
BJ 540 IF STRIG(0)=0 THEN 560
NJ 550 GOTO 410
RG 560 WORD=WORD+1:LOCATE PEEK(85),PEEK(84),P
MQ 570 PIX$=CHR$(P):IF P<123 THEN 680:REM CURSOR OVER INVERSE CHARACTER
GP 580 SCRN$=CHR$(P-128)
OC 590 IF LEN(MAIN$)=4000 THEN 410:REM MEMORY FULL, ACCEPT ERASE, PRINT OR QUIT
IO 600 ? CHR$(126);:? SCRN$;:REM BACKSPACE, REPRINT LETTER
XB 610 MAIN$(LEN(MAIN$)+1)=SCRN$
NO 620 TEMP$(LEN(TEMP$)+1)=PIX$
TX 630 IF SCRN$<>" " THEN 560
RO 640 IF WORD=2 THEN GOSUB 110:GOSUB 140:GOTO 650:REM DELETE BLANK SPACE AFTER SINGLE LETTERS
SD 650 IF LEN(TEMP$)>151 THEN TEMP$=TEMP$(LEN(TEMP$)-112,LEN(TEMP$)):GOSUB 100
MO 660 POSITION 2,19:? TEMP$:REM PRINT WORD IN WINDOW
PS 670 GOTO 370
CF 680 IF PIX$="Q" THEN 860:REM COMMAND ROUTINE
LS 690 IF PIX$="E" THEN MAIN$="":GOTO 360
OS 700 IF PIX$<>"P" THEN 750
VF 710 OPEN #2,8,0,"P:"
RE 720 ? #2,MAIN$
LV 730 CLOSE #2
PC 740 GOTO 360
RM 750 IF LEN(MAIN$)=4000 THEN 360
BI 760 IF PIX$="C" THEN 360
MR 770 IF PIX$<>"R" THEN 800
ZD 780 FOR XX=1 TO 8:SOUND 0,47,10,15:FOR YY=1 TO 75:NEXT YY:SOUND 0,64,10,15:FOR YY=1 TO 75:NEXT YY:NEXT XX
SD 790 SOUND 0,0,0,0:GOTO 370
XR 800 IF PIX$="B" THEN GOSUB 110:GOSUB 140:GOSUB 100:WORD=WORD-1:GOTO 660
HW 810 IF PIX$<>"D" THEN 840
KA 820 FOR L=1 TO OLDWORD:GOSUB 110:GOSUB 140:NEXT L
GO 830 GOSUB 100:GOTO 660
VJ 840 REM POKE 8208,100:CLOSE#2:OPEN #2,8,0,"V:":?#2;MAIN$:CLOSE#2
PF 850 GOTO 360
YH 860 CLOSE #1:GRAPHICS 0:END
ZR 870 REM DATA FOR WORD SCREEN
FG 880 DATA 2,8,13,19,23,30
ED 890 DATA DID,HAVE,HOW,I'M,LET,THAT,WAS,WILL,WHO,WHAT,WHY,WHEN
TG 900 DATA ALL,ARE,CAN,EAT,GET,HER,HIS,OUR,SEE,THE,YES,YOU
TG 910 DATA COLD,FOOD,HOME,MUST,NEED,SEEN,SICK,PLAY,SOME,TOO,YOUR,WORK
CK 920 DATA AM,AT,DO,HI,IS, ,IT,ME,MY,NO,TO,WE
RT 930 DATA DRINK,HAPPY,LET'S,LOVE,ROOM,SLEEP,TELL,THERE,THEIR,THINK,TIME,WHERE
LR 940 DATA BATHROOM,DOES,GO,GOING,GOOD,H
```

```
   OT,MEDICINE,NOT,NOW,PLEASE,THANKS,THIS
SE 950 ? CHR$(253);:GOSUB 100:REM ERRORS
BE 960 ERR=PEEK(195):ERRLN=PEEK(187)*256+
   PEEK(186)
CV 970 IF ERR<>138 THEN 990
VP 980 POSITION 2,19:? "PRINTER ERROR.CHE
   CK PRINTER AND CABLE.":GOTO 1000
VH 990 POSITION 2,19:? "ERROR ";ERR;" AT 
   LINE ";ERRLN
YQ 1000 ? "PRESS JOYSTICK BUTTON TO CONTI
   NUE."
AH 1010 IF STRIG(0)=1 THEN 1010
DO 1020 CLOSE #2:TRAP 950:GOSUB 100:GOTO
   660
RB 1030 TRAP 950
QS 1040 DIM WORD$(8),MAIN$(4000),PUNC$(18
   ),ARY(6),PIX$(1),SCRN$(1),TEMP$(175)
PE 1050 PUNC$=",;:.!?'#()&$%*+-/="
JL 1060 GRAPHICS 2+16:POKE 708,0:POKE 710
   ,132:POKE 712,30:POKE 65,0:POKE 731,1
EK 1070 ? #6:? #6;"   STICK WRITER":? #6:
   ? #6:? #6
XD 1080 ? #6;"            BY":? #6:? #6:? #6;
   "   BILL LUKEROTH"
HB 1090 FOR TITLE=1 TO 30:IF STRIG(0)=0 T
   HEN POP :GOTO 1140
JM 1100 FOR L0=1 TO 50:NEXT L0:IF S=0 THE
   N S=10:GOTO 1120
XF 1110 S=0
KQ 1120 SETCOLOR 2,8,5
KC 1130 NEXT TITLE
AN 1140 RETURN
```

play it again, computer!

ATARI HOME HEARING TEST

Article on page 43

LISTING 1

Don't type the TYPO II Codes!

```
OI 5 REM HEARING TEST, LISTING 1
RV 6 REM BY C. JACKSON
FH 7 REM (c) 1985, ANTIC PUBLISHING
IL 10 DIM A$(32):CLOCK=1790000
KO 15 REM START SOUND IN AUDIO RANGE
RC 20 SOUND 0,P,10,14
UH 25 REM CHANGE CLOCK TO 1.79 MHZ
XP 30 POKE 53768,64
ER 35 ? "}Close your eyes.":? :? "Press t
   he joystick button"
HN 36 ? "when the pitch is low enough to
   hear.":? :? "Press [RETURN] to begin."
YD 40 INPUT A$
BM 45 FOR F=2 TO 255 STEP 4
YM 50 ? INT(CLOCK/(2*F));" HZ"
BU 55 REM CHANGE FREQUENCY
WY 60 POKE 53760,F
JF 65 FOR WT=1 TO 150:IF STRIG(0)=0 THEN
   POP :PRINT "THIS IS THE FREQUENCY YOU
   CHOSE.":GOTO 85
TZ 70 NEXT WT
IE 75 NEXT F
ME 80 PRINT "This is the lowest pitch the
   1.79 MHZ clock can produce."
EC 82 ? :? "If you couldn't hear this,":?
   "check your TV speaker."
ZU 85 END :REM AN END COMMAND TURNS OFF T
   HE SOUND.
```

LISTING 2

```
PL 5 REM HEARING TEST, LISTING 2
ZZ 6 REM BY CHARLES JACKSON
FH 7 REM (c) 1985, ANTIC PUBLISHING
LI 10 GRAPHICS 0:SOUND 0,200,10,10
GY 15 ? "................................
   ...#10":FOR WAIT=1 TO 1000:NEXT WAIT
UK 20 SOUND 1,200,10,10
IQ 25 ? "................................
   ...#20":FOR WAIT=1 TO 1000:NEXT WAIT
UZ 30 SOUND 1,201,10,10
KI 35 ? "................................
   ...#30":FOR WAIT=1 TO 1000:NEXT WAIT
VO 40 SOUND 1,202,10,10
MA 45 ? "................................
   ...#40":FOR WAIT=1 TO 1000:NEXT WAIT
```

LISTING 3

```
QL 2 REM HEARING TEST, LISTING 3
ZW 3 REM BY CHARLES JACKSON
FE 4 REM (c) 1985, ANTIC PUBLISHING
MP 10 GRAPHICS 2
NZ 15 CLOCK=1790000:P=50
UZ 20 SOUND 0,P,10,10:POKE 53768,96
XW 25 POSITION 0,5:? #6;"FIXED PITCH ONLY
   ":? INT(CLOCK/P);" HZ":GOSUB 105:GOSUB
   105
FB 30 POSITION 0,5:? #6;"SWEPT PITCH ONLY
   ":SOUND 0,P,10,0:SOUND 2,P,10,10:POKE
   53768,96
BI 35 FOR F=P TO 1 STEP -1
WW 40 POKE 53760,F
ZD 45 ? INT(CLOCK/F);" HZ"
HS 50 NEXT F
WT 55 SOUND 0,P,10,7:SOUND 2,P,10,7:POKE
   53768,96
II 60 POSITION 0,5:? #6;"BOTH PITCHES","T
   OGETHER"
BL 65 FOR F=P TO 1 STEP -1
IT 70 ? :? "FREQ 1","FREQ 2","DIFFERENCE"

VD 75 ? INT(CLOCK/P);" HZ",INT(CLOCK/F);"
   HZ";"      ";INT(CLOCK*(1/F-1/P));" HZ"

XA 80 POKE 53760,F
RC 85 GOSUB 105
HW 90 NEXT F
MH 95 GRAPHICS 0
NQ 100 END
IZ 105 FOR WT=1 TO 200:NEXT WT
YZ 110 RETURN
```

continued on next page

LISTING 4

```
RO 2 REM HEARING TEST, LISTING 4
ZW 3 REM BY CHARLES JACKSON
FE 4 REM (c) 1985, ANTIC PUBLISHING
ME 10 CLOCK=1200000:P=56
BV 15 FOR J=1 TO 3:GRAPHICS 2:RESTORE
TK 20 IF J=1 THEN SOUND 0,P,10,0:SOUND 2,
   P,10,15:POSITION 0,5:? #6;"CONSTANT PI
   TCH"
EO 25 IF J=2 THEN SOUND 0,P,10,15:SOUND 2
   ,P,10,0:POSITION 0,5:? #6;"DIFFERENT P
   ITCHES"
VV 30 IF J=3 THEN SOUND 0,P,10,15:SOUND 2
   ,P,10,15:POSITION 0,5:? #6;"BOTH PITCH
   ES"
AY 35 POKE 53768,96
JG 40 FOR I=1 TO 15
RZ 45 READ F:POKE 53760,F
VP 50 FOR WT=1 TO 100:NEXT WT
PN 55 NEXT I:NEXT J
LU 60 GRAPHICS 0
ZE 65 END
TA 70 DATA 48,48,47,46,48,46,47,50,48,48,
   47,46,48,48,50
```

TECH TIPS

*For machine language programmers, the following listing shows how the 800XL operating system disables BASIC when the machine is booted with the OPTION key depressed:

```
10 ;DISABLE BASIC
20 PORTB =    $D301
30        *=  $0600
40        LDA PORTB
50        ORA #$02
60        STA PORTB
70        .END
```

In short, the DISABLE routine sets bit 1 of PORT B (54017, $D301). When BASIC is enabled, this location contains 253 ($FD). Otherwise, PORTB contains 255 ($FF). You can enable BASIC by reversing the procedure, as illustrated in the next listing.

```
10 ;ENABLE BASIC
20 PORTB =    $D301
30        *=  $0600
40        LDA PORTB
50        AND #$FD
60        STA PORTB
70        .END
```

*The following two lines will load a binary file from BASIC:

```
10 OPEN #1,4,0,"D:FIL
ENAME"
20 X=USR(5576)
```

*It's easy to print out a disk directory from the DOS 2 menu. Press [A][RETURN], then type: **,P:[RETURN]** (Don't forget the comma before the P).

*Use these XIO commands in a Basic program to lock and unlock your files:

```
10 XIO 35,#1,0,0,"D:F
ILENAME":REM LOCKS A
FILE
20 XIO 36,#1,0,0,"D:F
ILENAME":REM UNLOCKS
A FILE
```

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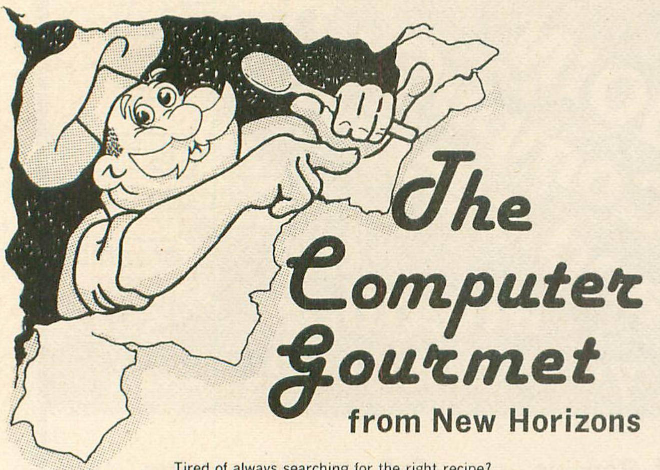
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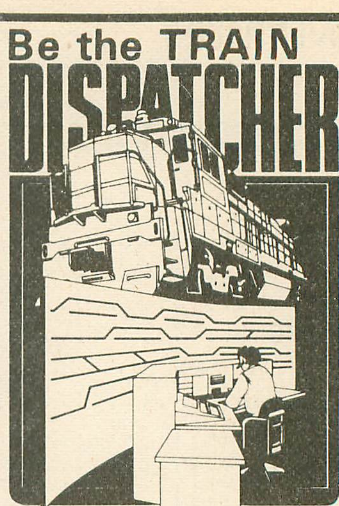
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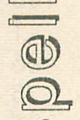
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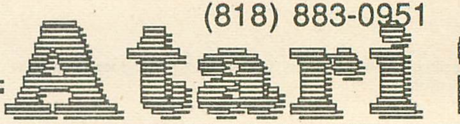
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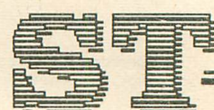
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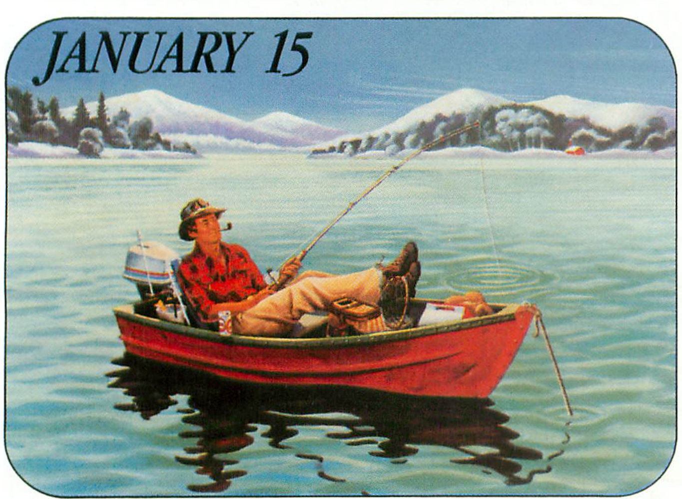


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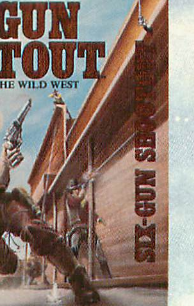
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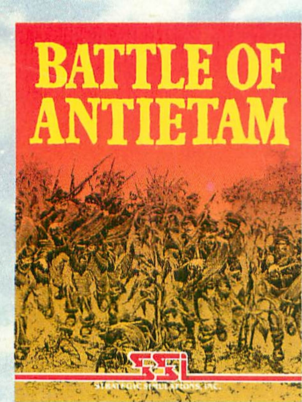
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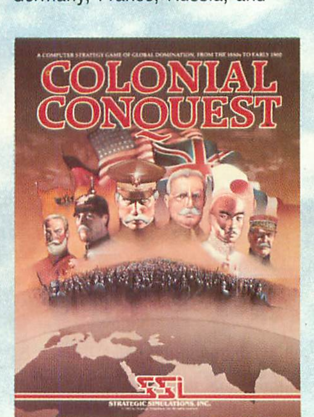
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